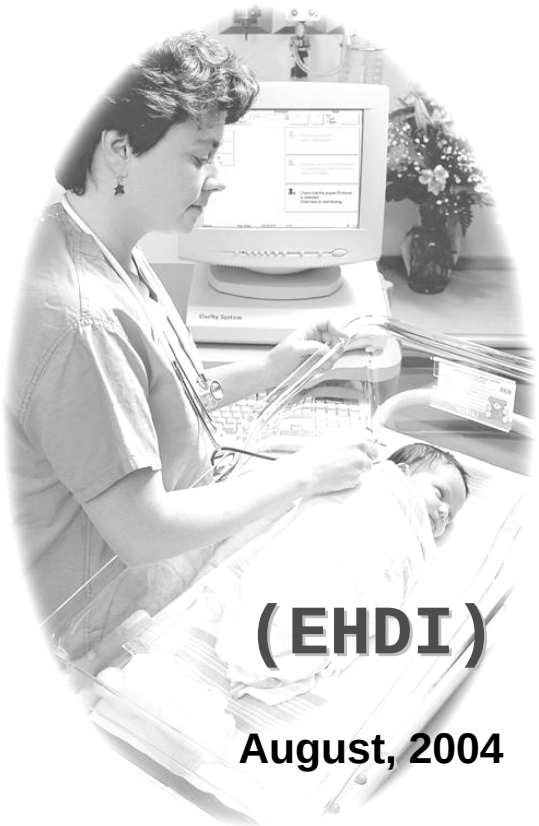
IDAHO SOUND BEGINNINGS

A Program of the Idaho Council for the Deaf and Hard of Hearing

GUIDELINES FOR EARLY HEARING DETECTION AND INTERVENTION



(EHDI)

August, 2004

Council for the Deaf and Hard of Hearing, 1720 Westgate Dr.- A, Boise, ID 83704

Federal Government Goals for *Healthy People 2010*

- To increase to 100% the proportion of newborns served by state-sponsored early hearing detection and intervention programs.
- To provide 100% of newborns access to screening.
- To provide follow-up audiologic and medical evaluations before 3 months for infants requiring care.
- To provide access to intervention before 6 months for infants who are hard of hearing or deaf.

"1-3-6"

Hearing Screening by 1 month of age –

Diagnostic Testing by 3 months of age –

Early Intervention by 6 months of age

➔ Improved Outcomes

Idaho Sound Beginnings

Early Hearing Detection and Intervention

Program Guidelines

This program is coordinated by the Idaho State Council for the Deaf and Hard of Hearing
In cooperation with the Idaho Newborn Hearing Screening Consortium, and the Idaho Sound Beginnings Advisory Committee

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PREFACE:

IDAHO SOUND BEGINNINGS: GUIDELINES FOR EHDI - 2004

MAKING A DIFFERENCE

Hearing loss is the most common congenital anomaly – twenty (20) times more common than phenylketonuria, one of the common conditions for which newborns are required by law to be screened, and it is twice as common as hypothyroidism, sickle cell disease and galactosemia combined. No other disability has a more profound impact on an infant's ability to connect with the world than hearing loss.

Newborn hearing screening makes a difference for all children and their families. Studies show that the earlier a child is identified with a hearing loss and begins early intervention, the more likely they are to develop language and communication skills on a par with their hearing peers and lead productive lives.

Idaho's birth hospitals are screening newborns for hearing loss on a voluntary basis. They have made Newborn Hearing Screening a standard of care. This was accomplished without the Idaho Legislature having to mandate this valuable service. This progress came about because of the cooperation between Idaho physicians, hospitals, nurses, and other health care workers and their dedication to making sure that all Idaho newborns have a sound start in life.

Hospital hearing screenings are not definitive and only identify those babies who are likely to have a hearing loss. If the baby does not pass, then follow up diagnostic testing is important. The baby's primary care physician is the key to ensure that this happens. Early intervention can take many forms, such as fitting hearing aids, providing counseling and support for parents and teaching parents how to communicate with their baby.

WHY GUIDELINES MATTER

As programs have evolved in hospitals across the state, the Council for the Deaf and Hard of Hearing through its Idaho Sound Beginnings program and the Idaho Newborn Hearing Screening Consortium has provided training and guidance to hospitals to ensure that screening results are valid and that programs are run efficiently and effectively. These guidelines were developed to assist hospitals, physicians, audiologists, early intervention specialists, and others involved in the entire Early Hearing Detection and Intervention process to maintain the high quality of the newborn hearing screening programs, and to ensure timely follow up on babies who do not get screened or who need further services after the initial screen.

It is the goal of Idaho Sound Beginnings to continue to provide guidance and support to Idaho hospitals and to assist them in operating quality programs.

WHO DEVELOPED THE GUIDELINES

The Council for the Deaf and Hard of Hearing expresses gratitude to their many partners for sharing their expertise, time, and energy to design and model the voluntary statewide program to screen newborns for hearing, to provide diagnostic and intervention services for those newborns who may have a hearing loss, and especially to the EHDI team who worked to develop the guidelines.

Idaho Sound Beginnings acknowledges, with appreciation, the many other states that had already committed their policies and procedures to writing. They made their "guidelines" available to Idaho*. We honor here our major contributors for allowing and encouraging us to use portions of their documents especially:*

Michigan's Early Hearing Detection and Intervention System,

The National Center for Hearing Assessment and Management (University of Utah), and

The Connecticut Department of Public Health Universal Newborn Hearing Screening Program,

with special thanks to the coordinator of the Georgia Universal Newborn Hearing Screening and Intervention Initiative for allowing us to use their "Have You Heard" slogan.

Photos are reproduced courtesy of: Boys Town National Research Hospital and the National Center for Hearing Assessment and Management.

* Certain sections adapted from an article by Dr. Evelyn St. Clair and Dr. Jill Beck, "*Can Our Littlest Patients Hear Us?",* The Newsletter of the Idaho Academy of Pediatrics, May 2001.

Idaho Sound Beginnings
Council for the Deaf and Hard of Hearing

GUIDELINES FOR EARLY HEARING DETECTION AND INTERVENTION (EHDI)

TABLE OF CONTENTS

APPENDICES: **61**

A. Speech and Language Development

a. Hearing Milestones

b. The Impact of Early Identification of Hearing Loss

c. Screener's Guide: How to respond to frequently asked questions

B. ISB (Idaho Sound Beginnings) Reporting Forms:

a. ISB Referral Form – *"Referral for Audiologic Rescreening and/or Diagnostic Evaluation*" and "Instructions for Hearing Screening Personnel"

b. ISB Results Form – *"Results of Diagnostic Audiological Evaluation"* and "Instructions for Audiologists"

C. Pediatric Audiology Network and Guidelines

D. Risk Indicators for Progressive and Late-Onset Hearing Loss

E. Selecting Equipment

F. Resources and Contacts

G. Order Form for ISB forms and brochures

H. Skills Checklists for Screeners

I. Hi-Track Training Outline

For information or materials not included here contact Idaho Sound Beginnings or check the website:

www.state.id.us/cdhh/ehdi

INTRODUCTION

GOAL

The goal of the Newborn Hearing Screening Program in Idaho is to promote Early Hearing Detection and Intervention (EHDI) by ensuring that-

All newborns receive a hearing screen at birth before discharge-with follow-up screening, if necessary, completed prior to one **(1)** month of age;

Prompt referrals and further testing be performed by a qualified pediatric audiologist with diagnosis prior to three **(3)** months of age; and

Any infant with a diagnosed hearing loss be immediately referred to the Idaho Infant Toddler Program, Department of Health and Welfare (DHW), for enrollment in early intervention services prior to six **(6)** months of age.

Screening for hearing loss before discharge is the critical first step in the EHDI process. 

PURPOSE

The Council for the Deaf and Hard of Hearing established ***Idaho Sound Beginnings (ISB)*** as Idaho's EHDI program. The purpose of this program is to: (1) identify infants at risk of having hearing loss; (2) notify the family and Medical Home primary care provider of such infants of the risk; (3) inform all responsible parties of resources available to them for further testing and treatment, including diagnostic, early intervention and culturally competent support services for such infants; (4) encourage the identification of a Medical Home for all infants identified; (5) establish and maintain a statewide data management system for tracking and follow-up; and (6) disseminate appropriate public and professional education and awareness materials.

ORGANIZATION

Idaho Sound Beginnings, was established in 2000 with funding from a four-year grant from the Maternal & Child Health Bureau in the U.S. Department of Health and Human Services. A fifth year of funding was later granted. It is administered by the Council for the Deaf and Hard of Hearing (CDHH). Major stakeholders share in the guidance of this statewide service through a voluntary Advisory Committee, and these stakeholders collaborate in facilitating these services to Idaho's newborn infants and their families.

BACKGROUND

The ***Idaho Sound Beginnings*** program has been developed in consultation with many persons including, but not limited to, pediatricians, otolaryngologists, nurses, audiologists, educators, parents, and others who work with deaf and hard of hearing children.

Major support for the development and operation of ***Idaho Sound Beginnings*** came from the Idaho Hospital Association (IHA). In May 2001, a letter of endorsement was sent to each hospital from the IHA Board of Directors. Every Idaho birth hospital, voluntarily, (without a legislative mandate), now includes a newborn hearing screening program as part of its standard of care and participates in annual program review.

The Standard of Care

Newborn hearing screening has been endorsed by a wide range of authoritative groups, including the American Academy of Pediatrics, American Academy of Audiology, National Association of the Deaf, Joint

Commission on Infant Hearing, National Institutes of Health, Centers for Disease Control, American Speech and Hearing Association, March of Dimes, and others. Newborn hearing screening programs are now operating in every state and more than 89% of all newborns are screened for hearing loss. (National Center for Hearing Assessment and Management-NCHAM, 2004) Newborn hearing screening programs can no longer be viewed as experimental given that hundreds of hospitals have been operating successful EHDI programs for more than a decade and newborn hearing screening equipment is now widely available and relatively inexpensive.

The available evidence suggests that newborn hearing screening easily meets the standards used to judge whether a particular practice has become the medical/legal standard of care. (NCHAM)

The Joint Committee on Infant Hearing (JCIH) has established standards for the evaluation of Early Hearing Detection and Intervention (EHDI) programs. These standards are used to evaluate Idaho's statewide program – ***Idaho Sound Beginnings***, as well as each birth hospital's individual program.

Joint Committee on Infant Hearing Benchmarks (JCIH) -

Total Screened (Hospital)	*greater than or equal to*	≥	95%	Screened
Inpatient Screening	*less than or equal to*	≤	10%	Referred for Outpatient - rescreen
Outpatient/ Re-screen	*greater than or equal to*	≥	70%	Return rate for follow-up
Referral for Diagnosis	*less than or equal to*	≤	4%	Of total infants screened referred for diagnostic evaluation
Audiologic Follow-up	*greater than or equal to*	≥	70%	Of referred infants received diagnostic evaluations

From Year 2000 Position Statement: Principles and Guidelines for Early Hearing Detection and Intervention Programs

1 – 3 – 6

Screen Diagnose Intervene

These 7 national goals were developed by the Centers for Disease Control, along with other organizations, to address the comprehensiveness of the EHDI program and reflect the ideal achievement:

Goal 1: All newborns will be screened for hearing loss before **1 month of age**, preferably before hospital discharge.

Goal 2: All infants who screen positive will have a diagnostic audiologic evaluation before **3 months of age**.

Goal 3: All infants identified with a hearing loss will begin receiving appropriate early intervention services before **6 months of age**.

Goal 4: All infants and children with late onset, progressive, or acquired hearing loss will be identified at the earliest possible time.

Goal 5: All infants with hearing loss will have a medical home.

Goal 6: Every state will have a complete EHDI Tracking and Surveillance System that will minimize loss to follow-up.

Goal 7: Every state will have a comprehensive system that monitors and evaluates the progress towards the EHDI Goals and Objectives.

Early Hearing Detection and Intervention (EHDI)

1 **Before ONE month**
Hearing Screening

3 **Before THREE months**
Hearing Diagnostic

6 **Before SIX months**
Early Intervention

⇨ **Improved Outcomes**

GUIDELINES FOR HOSPITALS AND BIRTH FACILITIES

1. PROGRAM COORDINATION OVERVIEW

All Idaho birth hospitals are offering newborn hearing screening (June, 2004). These guidelines are organized to assist hospitals and birth facilities to operate their screening programs in an effective and efficient manner. (The term "birth facility" is used throughout to refer to hospitals, birth centers, etc. where newborn hearing screening may be performed.)

The main topics addressed in these guidelines include:

Coordination of the screening program
Communicating with Families
Policies and Procedures
Personnel and Training
Screening Equipment
Screening
Follow up and Tracking
Quality Improvement

COORDINATION

- Each birth facility should designate a Program Coordinator to manage newborn hearing screening services.
- The medical aspects of the newborn hearing screening (NHS) program should be under the direction of the Medical Home primary care physician.
- The screening and diagnostic aspects of the program should be overseen by an audiologist experienced in working with infants and children.

COMMUNICATING WITH FAMILIES

- Newborn hearing screening is relatively new. It is unlikely that the family is knowledgeable about the procedures or what the tests mean. Every opportunity should be utilized to ensure that families or another responsible party are informed before, during, and after the screening.

POLICIES AND PROCEDURES

- Each birth facility will develop policies and procedures specific to all aspects of the program. (Section 2, Policies and Procedures)

PERSONNEL AND TRAINING

- Each birth facility must ensure that sufficient trained and qualified staff is available seven days a week to conduct the hearing screening.

EQUIPMENT

- Each birth facility is responsible for selecting, securing, and maintaining appropriate testing equipment according to professional standards. (Appendix E , Selecting Equipment).

SCREENING

- The birth facility is responsible for ensuring that an initial newborn hearing screening is conducted on all newborns prior to discharge.

FOLLOW UP AND TRACKING

- When an infant does not pass the initial screen, or has any risk indicators, the birth facility is responsible for informing the mother/guardian and obtaining her signature on the ***Idaho Sound Beginnings*** **(ISB) Referral Form**.
- The birth facility is responsible for ensuring that, if needed, the second screen is performed either later in the infant's newborn nursery stay, or by appointment as an outpatient at the birth facility between 7 and 14 days after birth. (Protocol for timing of second screens may vary according to type of equipment used.) (Section 7, Hearing Screening Protocol)
- When an infant does not pass -or does not return for- the second screen, or has risk indicators for late-onset or progressive hearing loss, the birth facility will forward the signed **ISB Referral Form** for audiologic evaluation containing biographical data, hearing screening results and other pertinent data to the central office of ***Idaho Sound Beginnings.*** (Section 9, Tracking and Reporting Requirements).
- The birth facility will establish a plan to inform the infant's responsible party of resources available to them for further follow up testing, treatment and intervention services, as needed.
- Each birth facility is encouraged to use software, known as *Hi-Track*, to establish and maintain the newborn hearing screening database including: recording screening results, generating program reports, generating parent and physician notification letters, and to transmit aggregate data each month to the central office of ***Idaho Sound Beginnings (ISB).***

QUALITY IMPROVEMENT

- Each NHS Program Coordinator is responsible for the development and administration of a quality improvement (QI) plan specific to the newborn hearing screening program. (Section 10, Quality Improvement)

2. POLICIES AND PROCEDURES

Each birth facility will develop written policies and procedures related to the newborn hearing screening program, including the necessary screener training, the screening process, data management, quality improvement and the testing of equipment.

The policies and procedures should be reviewed at least annually and should include, but not be limited to the following items.

COORDINATION

- Provide the name and telephone number of the NHS Program Coordinator, and information as to how to contact with questions or concerns.
- Identify the title of the staff person(s) responsible for the training of all screeners.

COMMUNICATING WITH FAMILIES

- Include a plan for discussion of NHS in pre-natal courses.
- Ensure that educational information about NHS is provided to the parents prior to the screening, and that the results of the hearing screening are explained to the infant's responsible party by qualified staff, in a location that maintains patient privacy and confidentiality.
- Describe how the **ISB Referral Form** is used to notify the family of screening results; along with any other methods of communication chosen.
- Include follow-up information and procedures for families of infants in need of further testing.

SCREENING

- Identify the optimal testing environment as well as the desired condition or state of the newborn during testing.
- Describe the screening method for the first screening. Otoacoustic emissions (OAE) or automated auditory brainstem response (AABR) are acceptable methods for the first screening.
- Describe the screening method for the second screening. OAE is acceptable as the second screening measure; however, AABR is the preferred method used for any infant who does not pass the first screening and is in need of a second screen before discharge.
- Describe the screening protocol to be used for the screening process, i.e. a common two-stage OAE protocol using outpatient rescreening, or a two-stage AABR protocol using inpatient rescreening with direct refers for audiologic diagnosis at discharge.
- Identify the number of weeks of gestation at which infants will be screened.
- Include a mechanism to conduct a visual assessment of the newborn's skin for conditions that might necessitate the need for an alternate testing device.
- Identify ototoxic and other medications, which may interfere with testing. Include a plan to conduct the hearing screening after completion of the course of such medications.

Policies and Procedures continued:

- Identify safety measures and infection control practices.
- Identify the title of the staff person responsible for overseeing the completion and distribution of the **ISB Referral Form**, to notify the responsible parties (e.g. the primary care provider, audiologist, ***Idaho Sound Beginnings***, and family) of screening results, including the presence of risk factors, and identify any other methods of notification used.

EQUIPMENT

- Identify the name, model or type of testing equipment, including the manufacturer's name, address and telephone number. Care, use, trouble-shooting, replacement of parts, maintenance and servicing of the screening equipment should be included.

TRAINING

- Document all job descriptions, qualifications, roles and responsibilities for each newborn hearing screening position (e.g. Program Coordinator, audiologist, nurse, nursing assistant, other aide, technician, etc.), as well as orientation, minimum length of training, level of supervision and continuing education plans. Specific guidelines for periodic supervised performance appraisals should be included.

FOLLOW UP AND TRACKING

- Describe the methods used to document and track all births, including the date, time and results of all hearing screens conducted, all infants referred, and all refused and/or missed screens.
- Include a mechanism to identify the name, address and telephone number of the newborn's Medical Home primary care provider, who will be following the infant after discharge.
- Include a procedure for the timely transmission of the necessary data elements to ***Idaho Sound Beginnings***. (Section 9, Tracking and Reporting Requirements).
- Describe how the **ISB Referral Form** is used to notify the infant's primary care provider, the ***Idaho Sound Beginnings*** program and the family of screening results; along with any other methods of communication chosen.
- Describe the methods of communication used to notify ***Idaho Sound Beginnings*** of all infants not screened, including documentation of the reason in *Hi-Track*, i.e. a refusal because of conflict with religious tenets or due to a missed screen.
- Identify risk indicators associated with hearing loss that may necessitate the need for ongoing, periodic assessments and explain the ***Idaho Sound Beginnings*** referral system that provides a mechanism to inform the parent of the risk and follow-up actions parents should take. (Appendix D, Risk Indicators)
- Describe all mechanisms used, including the **ISB Referral Form**, to document all infants referred for further diagnostic testing; include the name, address and telephone number of the pediatric audiologist to whom the infant was referred.

Policies and Procedures continued:

- Outline the mechanism for providing the family of any infant who is in need of further diagnostic testing with a plan regarding follow-up services; include the brochure titled, *"What do I do now? – A Parents Guide",* and a copy of the list of Comprehensive Pediatric Diagnostic Testing Centers in the state. (Appendix C, Pediatric Audiology Network)
- Outline methods used to encourage the family to schedule the appointment for follow-up services at a Comprehensive Pediatric Diagnostic Center as soon as possible (to ensure diagnosis by 3 months).

QUALITY IMPROVEMENT

- Include a quality improvement plan.

A copy of the written policies and procedures should be located in close proximity to the screening site, and be readily accessible to staff involved with newborn hearing screening. The policies and procedures need to be kept current, be reviewed periodically as per facility policy, and be readily accessible to staff involved with the newborn hearing screening.

3. COMMUNICATING WITH FAMILIES

Families that understand what is going to happen, are informed of the outcomes and who understand the next steps are less likely to be overly concerned about the screening results and are *more likely to follow up*. Communication should be in the primary language of the home as well as presented in a culturally competent manner.

Newborn hearing screening is relatively new and it is unlikely that the family is knowledgeable about the procedures or what the tests mean. There are several opportunities to ensure that families or another responsible party are informed before, during and after the screening.

Before Screening - Education prior to the screening includes information distributed in birthing classes, brochures in the admission packet, a video on the closed circuit TV, or other printed material distributed to the family by the birth facility. Regardless of how the information is provided the family should be informed before the screening of:

What- is going to be done and by whom.

Why - The importance of detecting hearing loss at an early age and the impact hearing loss may have on speech language, social, emotional, and cognitive development. (Appendix A, Speech & Language Development)

General information that much can be done, and programs are available to assist families if the newborn has hearing loss, and

Information on the right to refuse the screening if applicable.

During Screening - During the screening and right after, it is critical that the screener knows exactly what they should and should not say. It is important that the screener knows who will tell the parents of the results of the screen, when, where, and how. Unless the screener is trained to explain the implications of the screening results, the screener should tell the family who will discuss this with them.

After Screening – As soon as possible after screening, and before discharge, the family should be told:

The results of the screening, and what the results mean.

What should happen next.

Who is getting the results, and a discussion of the referral form if the baby does not pass. (The referral form lists the phone number of the Idaho CareLine;* they will be able to connect the family to their local Child Development Center if assistance is needed to obtain the follow-up screening or diagnostic testing.)

Information about normal development, developmental "hearing" milestones and risk factors for late onset or progressive hearing loss.

If in need of diagnostic testing give pamphlet, "*What do I do now*?" and list of Comprehensive Pediatric Diagnostic Centers for evaluation. Encourage the parents to dial the Idaho CareLine* if assistance is needed.

(* To contact the Idaho CareLine – Dial 211 or (800) 926-2588)

4. PERSONNEL AND TRAINING

Staff training will include the purpose and scope of the birth facility's newborn hearing screening program, as well as a review of all policies related to the newborn hearing screening program. Whenever possible the services of a qualified pediatric audiologist should be obtained to coordinate the basic and annual update training.

The program coordinator/manager, in consultation with a pediatric audiologist, will be responsible for the training and annual competency evaluation of all screeners.

OVERVIEW OF TRAINING:

Scope: The training should identify the roles, responsibilities, assigned tasks, scope of practice, and limitations of the duties of the screener.

Trainers: Trainers should have experience in newborn hearing screening. (It is preferable not to allow screeners to train each other.)

Availability: Be readily accessible to all staff involved with newborn hearing screening.

Be hands-on and competency based.
(Appendix H, Skills Checklist for Screeners)

TRAINING SHOULD INCLUDE:

Instruction on the use of the **ISB Referral Form** -

As a follow-up tool to notify the primary care provider, *Idaho Sound Beginnings*, and the family of screening results, or missed screens.

For referring an infant to a pediatric audiologist, when indicated.

The importance of obtaining parent/guardian signature on form to allow for further follow-up.
As a teaching tool to explain the screening and diagnosis procedure to parents.

Instruction on the accepted two-stage hearing screening protocol used by the facility. (May vary according to type of screening equipment used.)

Instruction on methods of data management, and the mechanism for transmission of the necessary data elements to *Idaho Sound Beginnings*, including the use of the *Hi-Track* data system.

Education on the use, care, maintenance, routine function checks, and troubleshooting of the testing equipment used.

A review of nursery policies including, but not limited to, infection control, safety, risk indicators, patient education and confidentiality, and safe baby handling techniques.

Training should not be limited to manufacturer representative's demonstrations. It should include supervised, return demonstrations of the screening process to evaluate the effectiveness of the training program and the competency of each individual screener. The length of training may be individualized.

5. EQUIPMENT

Each birth facility will be responsible for selecting and securing appropriate equipment according to standards, for screening all newborns for hearing loss prior to discharge.

(Appendix E Selecting Equipment)

Screening Equipment: Current non-invasive physiologic measures used for detecting hearing loss include Otoacoustic Emissions (OAE's) and/or Automated Auditory Brainstem Response (AABR). Both OAE and AABR technologies have been successfully implemented for Newborn Hearing Screening programs. The type of equipment used may influence the hospital's screening protocol, i.e. OAE programs typically use a screening process where 'referring' infants return for a second/outpatient rescreen in order to keep the refer for diagnostic testing rate low. This type of outpatient rescreening may not always be used by ABR programs due to their lower initial referral rates prior to hospital discharge.

Baseline rates: If the equipment does not have automated internal computerized settings for what constitutes a pass or refer, the birth facility should, in consultation with a pediatric audiologist, establish baseline pass/refer rates for all screening equipment used.

Maintenance: Information on the care, use and maintenance of the equipment should be included in the written hearing screening policies and procedures.

Calibration, service and maintenance of the testing equipment should be followed as directed by the manufacturer. Maintenance and service records should be maintained and be available for review by the consulting pediatric audiologist on contract or identified by ***Idaho Sound Beginnings***.

Note: well maintained equipment will positively affect referral rates.

Availability: The screening equipment should be available to nursing and/or other screening staff seven days a week and twenty-four hours a day.

Each birthing facility should ensure that appropriate backup testing equipment be readily available in the event of equipment malfunction. Such equipment may be available, on loan, from the Regional Infant Toddler-Child Development Center (DHW), or the ***Idaho Sound Beginnings*** Program (Appendix F , Resources)

If screening equipment is temporarily not available, every baby, who has missed their initial screening, should be provided with an appointment to return to the hospital for screening within 30 days.

Information on alternate screening sites, such as the Regional Infant Toddler-Child Development Centers* should also be given to the parents.

(* Dial 211 or (800) 926-2588 –the Idaho CareLine – for further information)

6. TESTING

The facility will provide an area conducive to hearing testing that is free from excessive light, ambient noise and/or other distractions that may impair the testing. Screening will be faster and more effective if noise levels are kept to a minimum and the baby is quiet and happy (preferably sleeping).

IT IS RECOMMENDED THAT:

Signage is posted to indicate that a hearing screen is in progress.

Short repeated attempts to screen are made over a period of hours; instead of spending 30 minutes on the initial attempt.

For OAE users, the ear canal should be inspected for debris (wax, blood, vernix) and the proper size probe ear tip be selected after examination of the ear canal size and angle.

(Appendix H, Skills Checklist for Screeners)

Newborns that have been discharged and return to the birthing facility for the initial or a repeat hearing screen, **should be** screened in an area that is separate from the newborn nursery, in accordance facility infection control policies.

Testing continued:

Training:	Train ***only*** as many hearing screeners as necessary. By keeping a small number trained for the procedure, you can ensure that each screener will have ample opportunities to screen infants and will have the experience needed with the screening equipment. Overlap the hiring and/or training of a new screener with [an] experienced screener.
Testing:	Whenever possible, test infants when they are 6 hours or older, when using OAE equipment. This slight delay allows the infant's ears to "dry", if wetness due to vernix in the ear canal is a problem. Optimally, test the infant after he or she is fed to provide a quieter baby and an easier screen. Teach good swaddling techniques for the infant to ensure a secure baby and a quieter test. If the parents approve, quiet a fussy baby with a pacifier during the test. Often a baby will suck for a brief period, and during the time they are not sucking on the pacifier, a good screening result can be obtained. Gently tug up and away on the infant's ear if the first trial yields poor results. (Infant ear canals are very pliable at this age and sometimes will collapse. The gentle tug will open the ear canal for an easier, accurate screen.) If the infant does not pass the first inpatient screen, repeat the hearing test a second time before discharge.
Program Monitoring:	Monitor screening statistics concerning refer rates. For OAE-based programs, they should typically be between 2-8%. Retrain screeners as necessary to maintain a low refer rate.
Outpatient Follow-up:	Follow-up on referrals from the hospital [birth facility] is one of the weakest links of EHDI programs. It is hard to get infants back for follow-up outpatient testing. Maintaining a low, accurate, refer rate can reduce the numbers required to return for testing, which will help significantly in operating a cost-efficient EHDI program.

(From an article originally published in "Sound Ideas Newsletter", July 2003 NCHAM www.infanthearing.org)

7. HEARING SCREENING PROTOCOL

Goal: The first goal of newborn hearing screening programs is to ensure that all newborns receive a hearing screen before discharge and screening /rescreening is completed **before one month of age**.

All birth facilities should establish a system/protocol for completing rescreening within one month.

Hearing Screen: A hearing screen is a pass/refer type of hearing test designed to identify newborns who require additional audiologic assessment in order to rule out or confirm the presence of a hearing loss.

Two-stage screening protocols are used to minimize the "refer for diagnostics" rate, with infants who do not pass their first screening being rescreened before referral for diagnostic audiologic testing.

Documentation: Birth facilities will create an electronic and/or paper hearing screening record for all infants born in their facility.

Equipment: The initial hearing screen is to be done in the birth facility prior to discharge using either otoacoustic emissions (OAE) or automated auditory brainstem response (AABR) equipment.

Communication: All birth facilities should inform families that their newborn will have a hearing screen as part of the standard of care.

All birth facilities should establish a system for communicating results to the family, ***Idaho Sound Beginnings***, the primary care provider, and, when appropriate, a pediatric audiologist.

All results will be explained to the infant's parent/responsible party before discharge.

The importance of newborn hearing screening and early identification of potential hearing loss should be relayed to parent(s)/caregiver(s) relative to its impact on speech, language, social, emotional, and cognitive development. (Appendix A, Impact of Hearing Loss)

Information on milestones for speech and language development should also be provided to families of newborns. Information and brochures can be obtained from the Council for the Deaf and Hard of Hearing and the Idaho Infant Toddler Program (DHW). (Appendix F, Resources)

Right of Refusal: The parent should have the opportunity to waive screening if desired.

NOTE: It is recommended that the birth facility designate a name, other than "fail," for screening results indicating a need for further testing. It is suggested that the term "refer" be used.

"The key to a positive outcome of any newborn hearing screening program is to connect the family and infant to the appropriate services."

A. INITIAL HEARING SCREEN

Pass**:** If an infant passes the first hearing screen in both ears, with no risk indicators for late-onset hearing loss, the screening process is complete.

The infant's mother or other responsible party and primary care provider will be notified of the results verbally and/or in writing, according to facility policy.

The 'Pass' screen result will be entered into *Hi-Track*, the electronic newborn hearing screening data system.

The facility will document that the infant has been screened and will record the results on the nursery log and in the infant's medical record.

Risk Indicators**:** Although an infant may "pass" the initial screen, the facility should identify any risk indicators associated with the potential for progressive or late-onset hearing loss, which may precipitate the need for audiologic monitoring every six (6) months until the child is three (3) years old; e.g. family history of hearing loss, syndrome associated with hearing loss, congenital infection, anatomic deformities, ototoxic medication use, etc. (Appendix D, Risk Indicators)

Risk indicators should be documented on the **ISB Referral Form** and in the *Hi-Track* database. (Section 9, Tracking and Reporting Requirements)

Any identified risk indicators should be explained to the parent/responsible party, prior to discharge.

Obtain the parent/responsible party's signature on the ISB Referral Form, and distribute form if screening is completed. Idaho Sound Beginnings will continue follow-up for these infants at risk of hearing loss.

(Appendix B, ISB Referral Form)

Refer For Rescreen**:** If an infant does not pass the initial screen in one or both ears, the hearing screen will be repeated for the ear(s) that did not pass-

- When **AABR** is used, the screen may be repeated prior to discharge.
- If **OAE** is used the screen should be repeated 7 to 14 days after birth or discharge.

Enter the initial screen result into *Hi-Track* and on the **ISB Referral Form**.

Any risk indicators should also be documented on the **ISB Referral Form** and in the *Hi-Track* database.

The screening result should be explained to the parent or responsible party.

Obtain the parent's signature on the ISB Referral Form.

An appointment for rescreen should be made.

The use of an appointment reminder card and/or phone call to the parents is highly recommended to increase the return for outpatient/rescreen rate.

Hearing Screening Protocol – Initial Hearing Screen, continued:

Missed Screen**:** (Discharged home without initial screening)

It is the responsibility of the facility of birth to contact and notify the infant's parent/responsible party and primary care provider, and arrange to have the infant return to the facility for an outpatient screening within 7-14 days.*

Enter "Missed" into the right and left ear inpatient result fields of *Hi-Track*.

All missed screens will be documented for internal quality improvement.

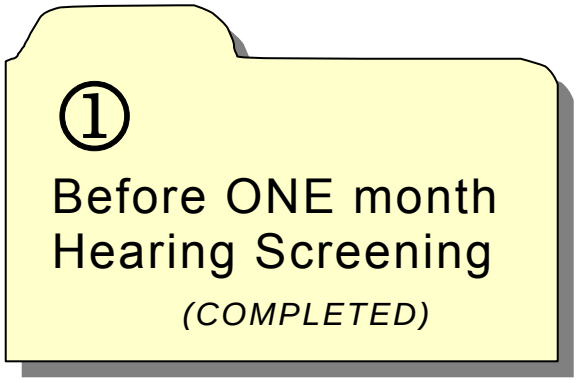
Document all contact efforts in the infant's medical record, and enter in *Hi-Track* ("broken appointment, lost, refused, etc.").

If the infant does not return to the birth hospital for the hearing screening within thirty **(30)** days of birth ('lost to follow-up'), the birthing facility will notify ***Idaho Sound Beginnings*** of the missed screen as part of the monthly aggregate data report.

In the event that an infant must return to the facility of birth for the initial hearing screen, the facility should ensure that the infant be screened in an area that is separate from the newborn nursery, in accordance with hospital infection control policies.

*In the event that the infant is not able to return to the birth facility for the hearing screening, the hospital should refer the family to another appropriate screening location, such as the Infant Toddler Child Development Center nearest to the family home.

(Appendix F, Resources-Infant Toddler Program, DHW, or refer the parents to the Idaho CareLine – Dial 211)



Hearing Screening Protocol continued:

B. RESCREEN/OUTPATIENT SCREEN

Pass**:** If an infant passes the outpatient/rescreen in both ears, with no risk indicators for late-onset hearing loss, the screening process is complete

(Follow procedure under: "Initial Hearing Screen – Pass.")

Risk Indicators: Although an infant may "pass" the outpatient/rescreen, the facility should identify any risk indicators associated with the potential for progressive or late-onset hearing loss and document on the **ISB Referral Form** and in *Hi-Track*, and obtain the parent's signature on the **ISB Referral Form**, and distribute.

(Follow procedure under: "Initial Hearing Screen – Risk Indicators.")

Referral To Audiologist**:** If an infant refers in one or both ears after a second screening, it is the responsibility of the birth facility to explain the results to the family and, to refer the newborn to a pediatric audiologist for further diagnostic testing.

Idaho Sound Beginnings recommends that infants be referred to a Comprehensive Pediatric Diagnostic Testing Center.

(Appendix C, Pediatric Audiology Network)

The appointment for follow-up with a pediatric audiologist should be made, and the information given to the family or responsible party at the time of referral. (With OAE this will be at the time of the outpatient rescreen, with AABR it may be at discharge if screening is completed.)

The name of the audiologist, appointment location, date and all screening results should be written on the **ISB Referral Form,** and "What do I do now – A Parent's Guide" given to the responsible party at the time of the referral.

The birth facility should notify the family or other responsible party, the primary care provider, the audiologist and ***Idaho Sound Beginnings*** by distributing the appropriate *(signed)* copies of the multi-part **ISB Referral Form**.

Telephone notification to the primary care provider is recommended.

The outpatient/rescreen result will be entered into the *Hi-Track* Database.

(Section 9, Tracking and Reporting Requirements)

If the primary care provider will be referring the family to the pediatric audiologist directly, the birth facility should secure the name of the audiologist and appointment information and enter it on the **ISB Referral Form**.

If the birth facility is unable to ascertain the pediatric audiologist appointment information, (e.g. due to a holiday or weekend), the facility should have a mechanism in place to notify the infant's primary care provider that the patient does not have a follow-up audiologic appointment.

The audiologist will be responsible for submitting the diagnostic results to ***Idaho Sound Beginnings***. (Appendix B, ISB Results Form)

Hearing Screening Protocol –Rescreen/Outpatient Screen, continued:

Outpatient/ Rescreen Not Done

If the infant does not return for the hearing rescreening appointment, the birth facility will attempt to contact the family and reschedule the rescreen within the 30 day period after birth.

In the event that the infant is not able to return to the birth facility for the hearing screening, the hospital should refer the family to another appropriate screening location, such as the Infant Toddler Child Development Center nearest to the family home. (Appendix F, Resources-Infant Toddler Program, or refer the parents to the Idaho CareLine – Dial 211)

If the infant does not return for rescreen during the 30 days following birth, the signed **ISB Referral Form** will be distributed, as indicated on the form, and ***Idaho Sound Beginnings*** will continue the follow-up.

Note: The largest percentage of infants are lost to follow-up during the "Return for Rescreen" stage. Obtaining the parent's signature on the ISB Referral Form immediately after the initial hearing screen refer and/or whenever risk indicators are present, is a simple yet efficient way to ensure that follow-up can be continued for these babies who are at a higher risk for hearing loss.

Hearing Screening Protocol continued:

C. OTHER SCREENING SITUATIONS AND/OR CIRCUMSTANCES

Adoption or Foster Care**:** Newborns who are scheduled to be placed for adoption should have the hearing screening and any repeat screenings conducted prior to discharge.

All screening information will be entered into *Hi-Track*.

If a referral for follow-up is indicated, the follow-up information will be entered on the **ISB Referral Form**, and also given to the representative of the adoption agency at the time the newborn is discharged, as well as to the birth facility social worker and/or discharge planner, as per facility policy.

The name of the infant's primary care provider who will care for the infant after discharge should be obtained and recorded.

If the name of the physician that will follow the infant after discharge is unknown, the name, address and telephone number of the adoption agency will be recorded in place of the physician's information.

Idaho Sound Beginnings will be notified of the screening results.
(Section 9, Tracking and Reporting Requirements)

Transfers: The **Birth** facility is responsible for reporting hearing screening status to the **Receiving** hospital.

Documentation regarding the hearing screen status should be included on any transfer form, i.e.- Pass/completed, Refer for rescreen, or Not completed.
Indicate as a " transfer" in *Hi-Track*.

(The **Birth** facility may be required to conduct any necessary rescreening at a later date.)

The **Receiving** hospital is responsible for ensuring the hearing screening is conducted before discharge.

All screening results (and risk indicators) should be entered in *Hi-Track,* and

The **ISB Referral Form** should be completed for refers, or to indicate the presence of risk indicators. (A larger percentage of transferred infants may have one or more risk indicators for late-onset hearing loss.)
(Appendix D, Risk Indicators)

If rescreening is necessary, the receiving hospital should refer the infant to the screening facility most conveniently located for the family. This may be the **Receiving** hospital, the original **Birth** facility, or the regional Infant Toddler **Child Development Center**.
(Appendix F, Resources- Infant Toddler Program, DHW)

Rescreening should be completed within 7 to 14 days after discharge.

The **ISB Referral Form** should be distributed as indicated on the form.

Hearing Screening Protocol – Other Situations and Circumstances, continued:

Out of State Births: All infants born in Idaho will have a hearing screening conducted prior to discharge.

Infants that are born out of state, who are transferred to an Idaho hospital/birth facility will have a hearing screening conducted before discharge.

The birth facility will notify ***Idaho Sound Beginnings*** of all screening results.

Out of Hospital or Home Births: Birth attendants at births outside of a hospital/birth facility will ensure that newborn hearing screening is completed within 1 month of birth.

Attendant will provide the family with the contact information of the local birth facility or audiologic site, such as the **Child Development Center**, where newborn hearing screening can be completed.

(See Appendix F, Resources-Infant Toddler, DHW)

The screening facility will report the results of the screening to the medical home and the Idaho Sound Beginnings program.

(Appendix B, ISB Reporting Forms)

Right of Refusal: In accordance with the rights of families and other responsible parties, the newborn hearing screening may be opposed due to a conflict with religious tenets and practice. The birth facility may have the parent or responsible party complete a newborn hearing screening waiver form.

The facility will notify the infant's primary care provider of the refusal.

The refusal should be documented in the Nursery Log Book, and entered into *Hi-Track*.

Hi-Track generated letters may be used to notify the primary care physician of the family's refusal, and to offer the family the option of screening at a later date. (Section 9B, *Hi-Track* Electronic Data Reporting Requirements)

(See the **Appendices** for further information on the **ISB Referral Form** and *Hi-Track)*

8. HOSPITAL/BIRTH FACILITY DOCUMENTATION

Documentation of the hearing screening must be maintained in the newborn's medical record by the birth facility. It should include the following:

The screening date(s), type of equipment used, outcomes, and any refusals.

The name of the infant's primary care provider after discharge, including address and telephone number, if known.

The name, address, and telephone number of the pediatric audiologist to whom the infant was referred, if indicated, and appointment date/time, if known.

Referral information should be given to the responsible party and be documented.

It is strongly suggested that the infant's hearing screening results be documented on the Nursery Log, along with other pertinent birth information so that it is readily accessible and can provide a quick view of infants who are in need of a hearing screen before discharge.

9. TRACKING AND REPORTING REQUIREMENTS

Data management is essential to ensure a successful EHDI program. It provides a mechanism for tracking infants from the screening, to the infant's medical home, to the audiologist, and to agencies that provide early intervention. Data management also allows for the analysis of program outcomes at the birth facility and state levels, and serves as a source of information for professionals involved in the process of tracking and identifying infants with hearing loss.*

ISB Referral Form: The Idaho Sound Beginnings, **"ISB" Referral Form** is a key element in the tracking and follow-up process, allowing for parental signature for release of information and acceptance of privacy practices, and ensuring that demographic, contact, screening, and Medical Home information is complete for high-risk and referred infants. These factors are vital to ensuring follow-up is completed for these infants.

(Section 9A, ISB Referral Form)

Hi-Track: The National Center for Hearing Assessment and Management (NCHAM) has developed ***Hi-Track* tracking and follow-up software** to aid in the collection of screening and demographic information, and to facilitate the identification of children with hearing loss. *Hi-Track* allows Idaho birth facilities to efficiently collect and transmit the following essential data elements to ***Idaho Sound Beginnings*.**

(Section 9-B, *Hi-Track*)

The birth hospital or facility is responsible for monthly reporting of the following data elements:

1. Number of births
2. Number of infants screened prior to discharge (initial/inpatient screening)
3. Number of infants not screened prior to discharge
   A. Reasons infants' hearing was not screened
4. Number of infants who pass the initial screening
5. Number of infants who are referred for outpatient screening after initial screening *
6. Number of infants who return for outpatient screening*
7. Number of infants not rescreened
   A. Reasons infants' hearing was not rescreened
8. Number of infants who pass the outpatient screening
9. Number of infants who refer for diagnostic audiologic evaluation

Inconclusive
Refused
Transferred
Missed. . .

Locate/Lost
Refused
Broken Appt.
Scheduled
Follow-up discontinued .

*May not be applicable if a two-stage inpatient AABR protocol is used which refers directly to audiologic diagnostics at discharge.

Tracking and Reporting Requirements, continued

Idaho Sound Beginnings is responsible for tracking and reporting of:

1. Number of infants who complete the diagnostic audiologic evaluation process.
2. Number of infants with confirmed hearing loss.
3. Number of infants who receive early intervention services.
4. Infants who require monitoring for risk indicators.

The Joint Committee on Infant Hearing has established standards for the evaluation of Early Hearing Detection and Intervention (EHDI) programs. These standards are used to evaluate Idaho's statewide program – ***Idaho Sound Beginnings***, as well as each individual birth facility's program.

Joint Committee on Infant Hearing Benchmarks-

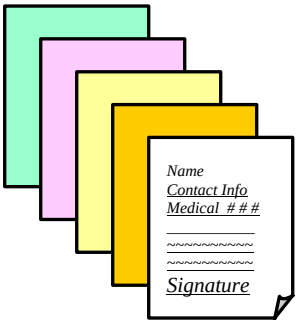
Total Screened (Hospital)	*greater than or equal to*	≥	95%	Screened
Inpatient Screening	*less than or equal to*	≤	10%	Referred for Outpatient/rescreen
Outpatient/ Re-screen	*greater than or equal to*	≥	70%	Return rate for follow-up
Referral for Diagnosis	*less than or equal to*	≤	4%	Of total infants screened referred for diagnostic evaluation
Audiologic Follow-up	*greater than or equal to*	≥	70%	Of referred infants received diagnostic evaluations

From Year 2000 Position Statement: Principles and Guidelines for Early Hearing Detection and Intervention Programs

Tracking and Reporting Requirements continued:

9A. THE IDAHO SOUND BEGINNINGS (**ISB**) **REFERRAL FORM**

(“*Referral for Audiologic Rescreening and/or Diagnostic Evaluation”)*



To be completed by the hospital or birth facility for any infant who **“refers”** after the first or second screen, or has **risk indicators**.

It contains a section for parental/caregiver release of information and authorization. Obtaining a parent/guardian *signature* allows for follow-up tracking, diagnosis, and early intervention for these infants. The form can also be used as a teaching tool to enhance parental understanding, at the time that the signature is obtained.

Completing the ISB Referral Form:

Obtain the parent’s signature at the time a **risk indicator** or **refer** is first noted,

The baby’s medical record number **must** be included on the **ISB Referral Form** to facilitate tracking and ensure that the child’s *Hi-Track* record can be identified,

Include the current Medical Home information and parent contact information,

Include any alternate contact numbers for the parent/caregivers,

Document all risk indicators on the referral form,

Document results of all screens - initial AND outpatient/rescreening results,

Document referral information for diagnostic audiologic follow-up, if applicable,

Distribute forms- if infant refers when rescreen is completed, or does not return for rescreen appointment. (Appendix B, ISB Referral Form and Instructions)

When a referral is received by ***Idaho Sound Beginnings*** (ISB), it is matched with the infant’s *Hi-Track* record.

Copies of ALL SIGNED REFERRALS are forwarded to regional Infant Toddler Early Intervention personnel. Tracking and follow-up for these high-risk infants is conducted by Infant Toddler in collaboration with ISB and includes: (Appendix F, Resources)

Ensuring that recommended diagnostic testing is completed,

Assisting and guiding the family through the diagnostic and intervention process,

Referring the family to Idaho Hands & Voices for support,

Ensuring that the Medical Home physician is notified of all results,

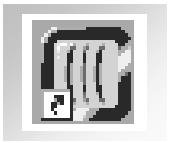
Data management, and

Ensuring that early intervention services are provided by Infant Toddler, Idaho School for the Deaf and the Blind, and others, as needed.

Note: obtaining a signature on the referral form ensures that the family will be connected to the many services which are available to assist and guide them through this process.

Tracking and Reporting Requirements continued:

9B. HI-TRACK ELECTRONIC DATA REPORTING



Idaho birth hospitals/facilities use *Hi-Track* tracking and follow-up software to manage their screening programs, and to report newborn hearing screening data/results to ***Idaho Sound Beginnings***.

All facilities that provide childbirth services are being asked to submit common data elements to ***Idaho Sound Beginnings***. (Appendix I, *Hi-Track* Training Outline.) Unless indicated otherwise, page numbers in this section refer to pages in the "*Hi-Track User Guide"*, which contains complete instructions for installing and using *Hi-Track*. A copy of the *"Hi-Track User Guide"* should be readily accessible to data management staff.

Coordination: Each birth facility that electronically submits data will select a designated coordinator to supervise the entry and retrieval of data using *Hi-Track*.

Only authorized persons who have received appropriate training will enter the data into the system.

Overview: The birth facility always creates the electronic *Hi-Track* record.

A new infant record will be created for <u>every</u> infant born or transferred into the program.

Data Essentials: The **mandatory** data fields for all infants (required by *Hi-Track*) are:

Medical ID **#** and ***Last Name*** – which must be entered by the person handling the tracking for each record and,

Birth Facility, ***DOB***, and ***Screening Site*** - which should be preset to auto-fill by the NHS coordinator during the initial program setup.

Other fields may also be designated as mandatory by the individual facilitity. (*User Guide* <u>Page 29</u>)

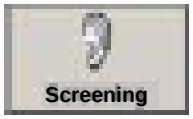
Hi-Track automatically assigns a ***Unique Hi-Track ID*** # to each infant, which is automatically inserted in place of the child's last name when data is transferred to the State (The hospital can override this option by choosing "Include Personal Identifiers" when transferring data files to the State. (*User Guide* <u>Page 66 </u>)

Back up *Hi-Track* data on a weekly basis (*User Guide* page 68).

Data Reporting: *Hi-Track* data will be submitted <u>monthly</u> to **Idaho Sound Beginnings** (EHDI program) by the 10th of the following month. Data files may be sent electronically, or on a disk.

In the event that access to electronic recording is temporarily disrupted, the data will be entered into the system by the facility of birth when access is restored. The birth facility will follow the "**Non-Electronic Data Reporting**" guidelines for prolonged interruptions, or if *Hi-Track* is not available.

Tracking and Reporting Requirements continued - Hi-Track:



INITIAL (INPATIENT) SCREEN RESULTS:

Pass: If the infant passes the first hearing screen and has no risk indicators, the result will be entered into their *Hi-Track* file and the process is completed.

Risk Indicators: If the infant has any risk indicators, they will be noted in the data file, along with all screening results. Contact information for the mother and primary care provider may also be entered in *Hi-Track* at this time.

(**ISB Referral Form** *should also be completed with contact information and the parent's signature at this time.)*

Refer For Rescreen: If the infant refers on the first hearing screen, the initial result will be entered into their *Hi-Track* file, and an appointment for a rescreen will be set and entered. Contact information for the Mother and/or alternate Contact may also be entered in *Hi-Track*.

(**ISB Referral Form** *should be completed with contact information and the parent's signature at this time.)*

Other: In addition to 'pass' and 'refer' results, other options which may be entered for the first screening results field include: inconclusive, transferred, and missed.

SECOND (OUTPATIENT)* SCREEN RESULTS:

Pass: If the infant passes the second hearing screen and has no risk indicators, the result will be entered into their *Hi-Track* file and the process is completed.

Refer for Diagnostics: If the infant refers from the second or outpatient screening, the results will be entered into their *Hi-Track* file. Other file information (Contact, Physicians, etc) should be updated as needed.

(Ensure that **ISB Referral Form** *contact information is complete, all screening results are noted, and parent's signature has been obtained on form for all refers and/or if risk indicators are present*.)

Other: In addition to 'pass' and 'refer', other options, which may be entered for the outpatient screening results field are: broken appointment, could not test, deceased, no screen, invalid, lost/locate, transferred, inconclusive, refused, scheduled, and follow-up discontinued.

Note- *Some hospitals may use an **AABR** inpatient screening protocol, which refers directly to diagnostic testing at discharge and does not require 'outpatient' rescreening.

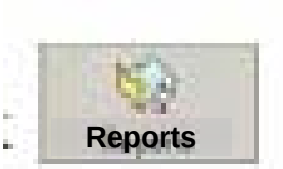
"NO SCREEN → DX" should be entered in the **outpatient** screening results field in *Hi-Track*.

Tracking and Reporting Requirements continued - Hi-Track:

OTHER DATA MANAGEMENT FEATURES:

Hi-Track can be used to help the birth facility manage their screening program by providing the ability to generate letters that communicate screening results to parents and physicians. Several types of letters are available; most can be customized to fit each individual hospital's needs. Letters of notification of results to parents and the Medical Home include: Pass,

Refer for outpatient or diagnostics
Refused or declined
Missed screen
Risk indicators (*User Guide* page 78)



It can also be used to generate reports that allow the facility to review the status of infants who need follow-up, such as the "Needs Outpatient Screening Report." Additional reports, such as the "Flow Chart" provide the hospital with a concise, one page summary of their hearing screening program.

(*User Guide* page 85)

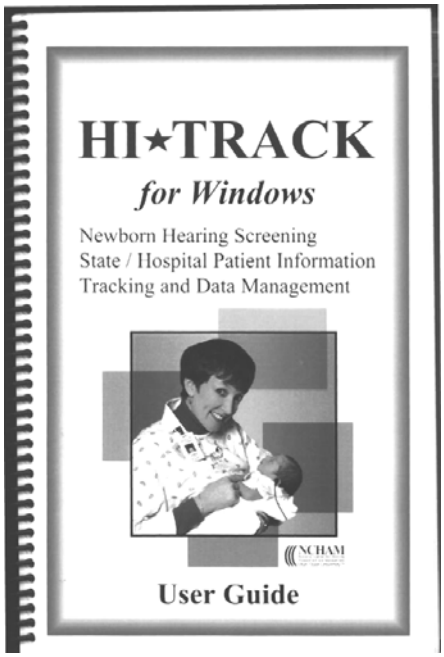
For questions related to the electronic entry or transmission of data, or information on any other data management features, refer to

the "*Hi-Track User Guide***"

the "*Hi-Track* for Windows Training Outline" in the Appendices, or contact:

Idaho Sound Beginnings - (208)-334-0879 (Voice)
(208) 334-0803 (TTY),
(800) 433-1361 (TTY),
(800) 433-1323 (Voice), or
NCHAM HelpDesk - (888) 827-0800.

(Mon.-Fri., 7:30 am to 5:45 pm, Mountain Time. Identify the name of your hospital and Idaho Sound Beginnings.)



(The latest version of the 'User Guide'** can also be downloaded from the *Hi-Track* website (PDF) at:

http://www.hitrack.org/support/index.html -US version

Tracking and Reporting Requirements continued:

C. NON-ELECTRONIC DATA REPORTING

In the event that Hi-Track is not available, birth facilities are responsible for the collection and reporting of the following minimum data monthly:

1. Number of births
2. Number of infants screened prior to discharge (initial/inpatient screening)
3. Number of infants not screened prior to discharge
    A. Reasons infants' hearing was not screened
4. Number of infants who pass the initial screening
5. Number of infants who are referred for outpatient screening after initial screening
6. Number of infants who return for outpatient screening
7. Number of infants not rescreened
    A. Reasons infants' hearing was not rescreened
8. Number of infants who pass the outpatient screening
9. Number of infants who refer for diagnostic audiologic evaluation

Inconclusive
Refused
Transferred
Missed. . .

Locate/Lost
Refused
Broken Appt.
Scheduled
Follow-up
discontinued. . .

Data should be mailed or faxed to Idaho Sound Beginnings by the 10th of each month.

The birth facility is responsible for the completion of the **ISB Referral Form** (including obtaining the parent/guardian signature) for any infant who refers from inpatient or outpatient screening, or who has any risk indicators. (Section 9A The ISB Referral Form)

10. QUALITY IMPROVEMENT

The goal of Quality Improvement (QI) is to develop and maintain excellent knowledge, purpose and performance of the staff that directly or indirectly administer and perform Newborn Hearing Screening (NHS).

OVERVIEW

- Each birth facility will develop a continuous Quality Improvement (QI) plan, which identifies and addresses quality issues pertinent to the newborn hearing screening program.
- The plan should identify the job titles and individuals responsible for internal review and evaluation of the process and outcomes specific to the NHS program.
- The plan should include the following areas for review, evaluation and correction as needed:

    1. Administrative policies;
    2. Performance and record review to ensure that services are provided based on standards of care;
    3. Physical facilities for NHS (e.g. low ambient noise);
    4. Family satisfaction with services;
    5. Program systems/data management including procedure for transmission of necessary data to Idaho Sound Beginnings;
    6. Outcome measures for NHS (e.g., JCIH benchmarks);
    7. Staff training plan. Employees are provided with job descriptions and an orientation to include minimum program requirements;
    8. An evaluative report of findings and recommendations for improving services;
    9. Communication with the community and with primary care providers;
    10. Development and distribution of culturally sensitive parent and community education materials.

BENCHMARKS AND QUALITY INDICATORS

- Nationally recognized benchmarks will be used to measure effectiveness, and assist in improving services to infants and their families.
- The use of an effective information/data management system (*Hi-Track*) will allow for the accurate and timely description of services provided to each infant.
- Benchmarks are used to evaluate progress by having identifiable objectives that are useful in monitoring and evaluating the program.
- Quality indicators are used to help ensure program efficacy, program consistency and stability.
- Benchmarks and quality indicators should be evaluated monthly and should be consistent with existing data, such as those referenced in the American Academy of Pediatrics Newborn Hearing Screening Policy Statement and the Joint Committee on Infant Hearing 2000 Position Statement.

Quality Improvement continued:

Benchmarks should include the following:

> A minimum of 98% of all babies will be screened during their birth admission or prior to one month of age.

Refer rate should not exceed 10%, and should average 1-4%. subsequent to a two-step hearing screen.

Return for follow-up (outpatient screen) rate should be 70% or more.

Quality Indicators should include the following percentages:

Babies screened during the birth admission.
Babies screened before one month of age.
Babies who do not pass the inpatient screen.
Babies who do not pass the outpatient screen.
Families who refuse NHS.
Parent/Caregiver provided with written results and educational materials.

Quality indicators should be monitored monthly by the birth facility NHS Coordinator (*Hi-Track* may be used to generate these reports – See Section 9B) and the ***Idaho Sound Beginnings*** statewide Data and Follow-up Specialist to ascertain whether the program is achieving expected benchmarks and outcomes (targets and objectives). Frequent measures of quality permit prompt recognition and correction of any unstable component of the screening and referral process.

COORDINATION

The NHS Coordinator is responsible to:

- Serve as the contact person/liaison for the family, the primary care physician, pediatric audiologist, birth facility management, and for the ***Idaho Sound Beginnings*** (**ISB**) data and follow-up specialist.
- Provide specific information and data, as requested, to ***Idaho Sound Beginnings*** preferably via *Hi-Track* by the 10th day of the month following the report.
- Initiate contact for technical assistance as needed, e.g. NCHAM, **ISB**, equipment manufacturer, pediatric audiologist, and/or hospital management.

COMMUNICATING WITH FAMILIES

- Each birth facility will provide culturally sensitive parent education materials.

PERSONNEL AND TRAINING

Each birth facility is responsible to:

- Have written policies and procedures to outline the plans for equipment training and skills assessment of all personnel involved with NHS.
- Provide annual equipment training for each staff member who performs NHS. This training may be completed by the equipment manufacturer's trainer (recommended once each year), by experienced staff or by a qualified Pediatric Audiologist.
- Ensure that 100% of newborn hearing screening staff pass skills competencies annually.

Quality Improvement continued:

EQUIPMENT

- Each birth facility is responsible to provide for monitoring equipment calibration and ordering supplies.

FOLLOW UP AND TRACKING

- Each birth facility is responsible to have a policy to manage tracking and follow-up of all infants who refer for a second/out-patient, screen that includes:

  Schedule the out-patient appointment; inform and educate the parents.

  Complete the ISB Referral Form and obtain signature.

  Provide reminder phone call to family prior to the scheduled out-patient screen.

  Monitor for broken appointments.

  Follow-up broken appointments with phone call and a letter.

  After third broken appointment, discontinue follow-up.

  Document outcomes and inform primary care provider and ***Idaho Sound Beginnings*** (include distribution of the **ISB Referral Form)**.

- Each birth facility is responsible to have a policy to manage tracking and follow-up of all infants who refer for diagnostic audiologic testing that includes:

  Referral for audiologic evaluation to a Comprehensive Pediatric Audiologic Center.

  Provide family with brochure, "What do I do now? A Parent's Guide."

  Document outcomes and inform primary care provider and ***Idaho Sound Beginnings*** (include distribution of the **ISB Referral Form**).

DOCUMENTATION

- Each birth facility will keep records that include:

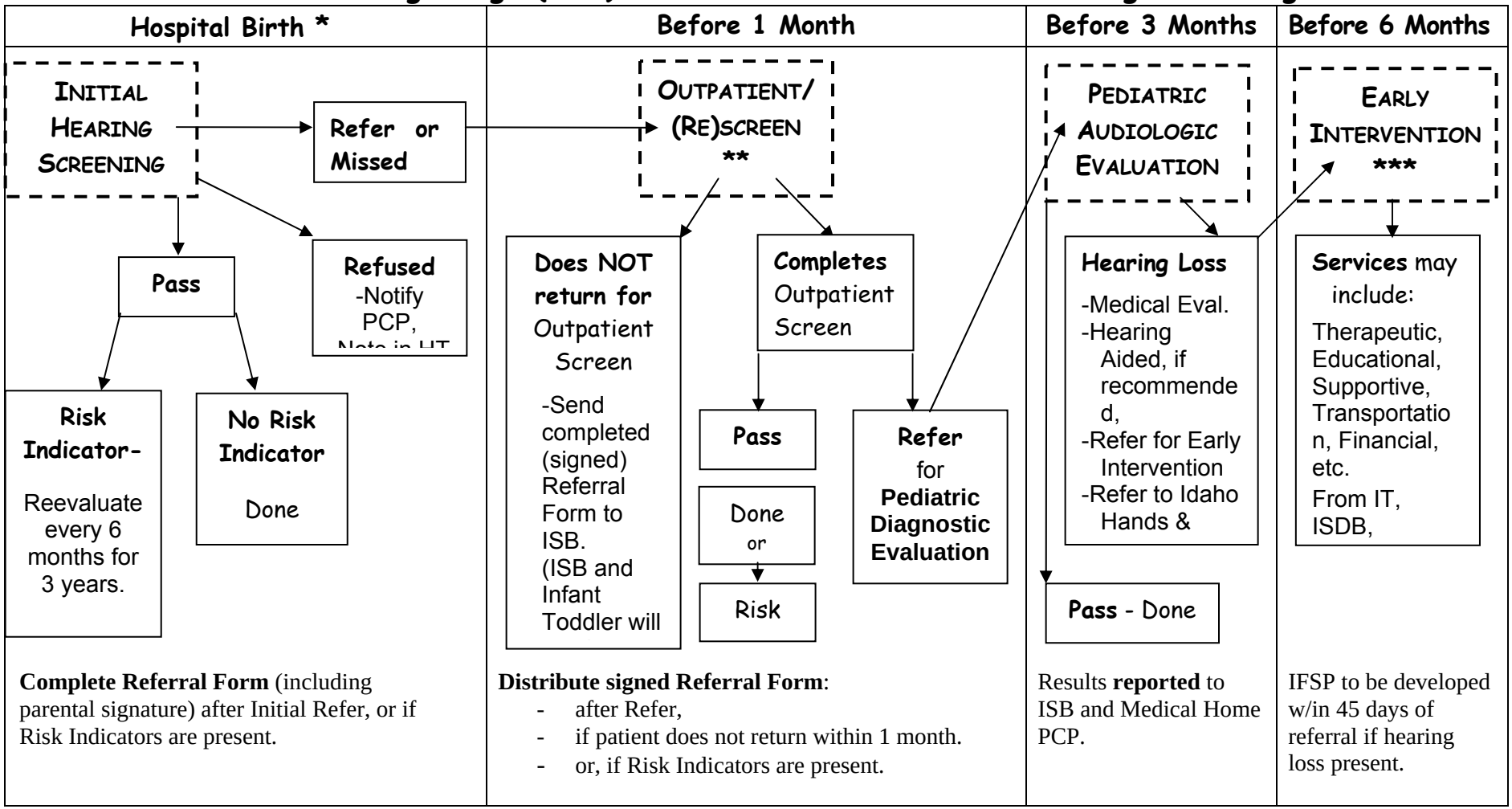
  List of screening staff.

  Current record of related training received.

  Current skills competency evaluation for each member of the team.

  Plan for next update by equipment manufacturer representative or Pediatric Audiologist.

Idaho Sound Beginnings (ISB) – Guidelines for Newborn Hearing Screening Providers



ENTER **ALL** INITIAL SCREEN RESULTS IN HT	ENTER **ALL** OUTPATIENT RESULTS IN HT	ISB UPDATES HT

* HOME BIRTHS – refer directly to Outpatient Screening

** With OAE Screen – rescreen within 1 month of birth
With ABR Screen – rescreen may be done before discharge

***Early Intervention (EI) Services are managed by the Idaho Infant Toddler (IT) program through the regional Child Development Centers (CDC). The CDCs can also provide outpatient screening services for infants from Home Birth it may be difficult for the infant to return to the Birth Hospital. EI services for children with hearing loss may be pro collaboration with the Idaho School for the Deaf and Blind (ISDB).

OAE = Otoacoustic Emissions
AABR = Automated Auditory Brainstem Response
PCP = Primary Care Physician
HT = Hi-Track - Data program
IT = Infant Toddler
ISDB=Idaho School for Deaf & Blind
IFSP = Individual Family Service Plan

GUIDELINES FOR THE MEDICAL HOME

"The American Academy of Pediatrics (AAP) believes that the medical care of infants, children, and adolescents ideally should be accessible, continuous, comprehensive, family centered, coordinated, compassionate, and culturally effective. It should be delivered or directed by well-trained physicians who provide primary care and help to manage and facilitate essentially all aspects of pediatric care. The physician should be known to the child and family and should be able to develop a partnership of mutual responsibility and trust with them. These characteristics define the **"Medical Home"** (AAP Policy Statement, 2002).

ONE MONTH OF AGE:

The Medical Home should ensure that all newborns receive a hearing screen (and rescreen, if needed) before ONE MONTH OF AGE**.** If the result of the hearing screen is unknown, the Medical Home should contact the birth hospital/facility's newborn hearing screening program to determine the hearing screen result. If the initial screen was missed, or in the case of a home birth, the parents should be directed to make a screening appointment at their local birth facility or Infant Toddler Child Development Center.

(Appendix F, Resources)

THREE MONTHS OF AGE:

For those newborns who do not pass the two-stage hearing screen, the Medical Home should ensure that a complete diagnostic outcome is obtained before the infant is THREE MONTHS OF AGE**.**

(Appendix C, Pediatric Audiology Network)

SIX MONTHS OF AGE:

If a hearing loss is identified, the Medical Home should ensure that early intervention services are initiated before the infant is SIX MONTHS OF AGE.

RISK INDICATORS:

It is the Medical Home's responsibility to monitor infants and young children for risk indicators for hearing loss. (Appendix D, Risk Indicators)

Costs of hearing screening, rescreening and/or diagnostic services may be covered by third-party insurers, Medicaid, CHIP, and/or Idaho Infant Toddler Services.

"1-3-6"

Hearing Screen by 1 month of age –

Diagnostic Testing by 3 months of age –

Early Intervention by 6 months of age ⟶ Improved Outcomes

"*Just in Time"* EHDI presentations and posters for physicians and families are available for viewing or downloading at the CDC EHDI website: www.cdc.gov/ncbddd/ehdi/

NORMAL HEARING SCREEN - pass result in both ears after a hearing screen or rescreen

(Sensitivity is at or near **100 %** normal.)

Medical Home's Responsibilities:

- Monitor ongoing development of child's communication skills.
- Provide referrals to a pediatric audiologist and other medical specialists for parental/caregiver concerns and/or suspected delays. A pediatric audiologist has the competence, extensive experience and equipment needed to evaluate the hearing acuity of newborns, infants, and young children.
  (Appendix C, Pediatric Audiology Network)
- For infants who pass the newborn hearing screen but who have risk indicators associated with late-onset, progressive, or fluctuating hearing loss, the Medical Home should ensure that the infant receives ongoing audiologic and medical surveillance every six months through age three, along with monitoring for communication development. (JCIH, 2000) (Appendix D, Risk Indicators)

Screening Hospital/Birth Facility's Responsibilities:

- Provide results to the infant's family.
- Provide written information to the infant's family regarding acquired, delayed onset, and progressive hearing loss, and normal hearing milestones.
- Provide results to the Medical Home.
- Report aggregate results to Idaho Sound Beginnings.

MISSED HEARING SCREEN - hearing screen not completed before discharge

(There is a **0.3%** risk of undetected bilateral hearing loss.)

Medical Home's Responsibilities:

- Ensure and coordinate the hearing screen with the family by one month of age or one month after discharge from the NICU.
- Aid screening hospital/facility with recall efforts, if needed.
- Counsel the family regarding the importance of having a hearing screen completed as soon as possible or by one month of age.

Screening Hospital/Birth Facility's Responsibilities:

- Retain initial responsibility for recall and hearing screen.
- Provide written notification to the infant's family.
- Provide written notification to the Medical Home, if infant does not return for the hearing screen after one month.

INFANT BORN OUTSIDE OF HOSPITAL/BIRTH FACILITY – i.e. home births

Medical Home's Responsibilities:

- Provide the family with the name, address, and telephone number of the local birth hospital or audiologic site, such as the regional Child Development Center, that provides newborn hearing screening services. (Appendix F, Resources)
- Counsel the family regarding the importance of having a hearing screen completed as soon as possible or by one month of age.

REFER RESULT FROM INPATIENT HEARING SCREEN - in one or both ears before discharge.

(The risk of hearing loss increases to **3%** or greater.)

dical Home's Responsibilities:

- Ensure and coordinate the hearing rescreen with the family by one month of age or one month after discharge from the NICU.
- Aid screening hospital/birth facility with recall efforts, if needed.

NOTE: Programs using AABR screening equipment, may choose to complete the two-stage screening protocol before hospital discharge. Infants referred after 'inpatient' hearing screening at these facilities would then proceed directly to diagnostic audiologic testing, without the need for further 'outpatient' hearing screening. (Check with the individual hospital for type of equipment used and their screening protocol.)[1]

Screening Hospital/Birth Facility's Responsibilities:

- Provide and explain written results to the family before discharge.
- Schedule an outpatient hearing rescreen before discharge.
- Report results to the infant's Medical Home primary care provider.
- Provide the family with a copy of the **ISB Referral Form** and an appointment reminder card.
- Report results to the Idaho Sound Beginnings/EHDI Program and primary care provider via **ISB Referral Form,** if infant does not return for the rescreen within 30 days.

REFER RESULT FROM OUTPATIENT HEARING RESCREEN - in one or both ears

(The risk of hearing loss increases to **30%** or greater.)

Medical Home's Responsibilities:

- Ensure that a referral is made to a pediatric audiologist for a comprehensive *diagnostic audiologic evaluation* to be completed as soon as possible, or **no later than three months of age.**
- Refer the family to the Idaho Careline (Phone # 211), if financial, or other, assistance is needed for diagnostic testing.

Screening Hospital/Birth Facility's Responsibilities:

- Provide and explain written results to the infant's family.
- Provide the family with a copy of "What do I do now? – A Parent's Guide."
- Provide the infant's family with a list of pediatric audiologists who can complete a comprehensive diagnostic audiologic evaluation as soon as possible, or no later than three months of age. (Appendix C, Pediatric Audiology Network)
- Make appointment with pediatric audiologist of parents' choice, in collaboration with the Medical Home.
- Provide written notification to the infant's Medical Home.
- Distribute the **ISB Referral Form** to report results to Idaho Sound Beginnings, Medical Home primary care provider, audiologist and family.

CONFIRMED HEARING LOSS

Early and consistent intervention, including hearing aids, when appropriate, is the key to achieving normal language development. Aids can be fit as soon as the hearing loss is identified; even infants can benefit from hearing aids.

The Joint Committee on Infant Hearing defines the targeted hearing loss for universal newborn hearing screening programs as permanent bilateral or unilateral, sensory or conductive hearing loss, averaging 30 to 40 dB or more in the frequency region important for speech recognition (approximately 500 through 4000Hz).

Medical Home Responsibilities:

Complete medical evaluation including:

History	Prenatal	•Ototoxic medication exposure
		•Any significant complications during pregnancy
		•Immunization to rubella
		•Syphilis screening
		•Maternal drug use
		•Frequent spontaneous abortions
	Perinatal	•Risk indicators for hearing loss (Appendix D)
	Family	•Family member(s) with hearing loss with onset at age < 30 years.

Review of hearing assessment results

Test results should identify degree and type of hearing loss at a minimum.

(See "Guidelines for Infant Audiologic Assessment" for recommended tests.)

Physical

Minor Anomalies: unusual morphologic features occurring in less than 5% of the population with no cosmetic or functional significance.

Major Anomalies: those causing cosmetic and/or functional abnormality (*i.e.*, cleft palate, cardiac, limb or skeletal deformities).

Poor growth and/or microcephaly.

Abnormal neurologic examination.

Abnormal ear examination: tympanic membrane abnormality; middle ear status (middle ear effusion can further limit hearing).

Lab

Cytomegalovirus (CMV) is the most common cause of viral induced hearing loss. The hearing loss is sensorineural; it may be unilateral or bilateral; it may be progressive or delayed-onset.

- Urine culture for CMV: test must be prior to 3 weeks of age to determine congenital CMV.
- CMV specific IgG and IgM antigens if under 6 months of age. Titers to detect CMV must be drawn early, before 6 months of age, to be accurate.

Referrals Refer to an Otolaryngologist for medical management of hearing loss, if necessary.

Refer for other medical services, if necessary, such as: ophthalmology, cardiology, neurology, and nephrology.

Refer for early intervention services.

Discuss the importance of genetic evaluation for determination of etiology and other possible health related issues. (see "Guidelines for Genetic Evaluation Referral.")

Ongoing care and monitoring:

- Monitor middle ear status to ensure the presence of middle ear effusion does not further compromise hearing.
- Monitor development of speech, language and communication skills, and other developmental milestones. Provide referrals related to parental/caregiver concerns or suspected delays.
- Ensure that a copy of "Help and Hope" Family Resource Guide has been provided to the family. Copies can be ordered, free of charge, from Idaho Sound Beginnings.
- Coordinate and ensure, that referrals for early intervention services are made as soon as possible after diagnosis. (see "Guidelines for Early Intervention.")
- Ensure that the family maintains timely follow-up with an audiologist and other consultants. An immediate diagnostic audiologic evaluation should be scheduled when there is concern related to a change in hearing.

Audiologic follow-up guidelines for:

- Sensorineural hearing loss and/or permanent conductive hearing loss (unilateral or bilateral), should be monitored:

  Age 0-3: Every 3 months, after hearing loss is confirmed.

  Age 4-6: Every 6 months, if intervention progress is satisfactory.

  Age 6 years or older: Every 6-12 months if progress is satisfactory.

- Transient conductive hearing loss (e.g., otitis media with effusion), unilateral or bilateral:

  Should be monitored after medical treatment (completion of antibiotic treatment, PE tubes, etc.), and/or at least on a 3-4 month basis until resolved and normal hearing is confirmed.

- Unilateral hearing loss (sensorineural or permanent conductive):

  Should be monitored every 3 months during the first year, then on a 6-month basis after the first year, to rule out changes in the normal hearing ear.

- Monitor consistent use of amplification, sensory devices, and/or assistive technology, if appropriate for the family.
- Monitor siblings for hearing loss.

Pediatric Audiologist's Responsibilities:

- Explain written results and recommendations of the diagnostic audiologic evaluation to the family at the time of diagnosis.
- Report results to the Medical Home and the ISB/EHDI program.
- Counsel parent(s)/caregiver(s) on the effects of the hearing loss, communication, and the need for immediate intervention.
- Provide the family with a copy of "Help and Hope" Family Resource Guide.
- Provide a referral to the regional Infant Toddler Program within two business days of the diagnosis.
- Counsel the parent(s)/caregiver(s) about family support through Idaho Hands & Voices.
- Discuss the importance of a genetic evaluation to determine etiology and other possible health related issues.
- Schedule audiologic follow-up appointments.
- Refer parent(s)/caregiver(s) back to Medical Home for further consultation and referrals.

Idaho Infant Toddler Service Coordinator's Responsibilities

- Assist the family in development of an Individual Family Service Plan (IFSP) to address the communication needs of the child.
- Report name and contact information of the Infant Toddler Service Coordinator to the Medical Home.
- Facilitate family service coordination for the family.
- Refer to local Parent/School Advisor, Idaho School for the Deaf and the Blind.
- Refer to Idaho Hands & Voices family support group.

Communication is essential in an effective Medical Home approach to providing coordinated health care services. The pediatrician/primary care physician is one of several team members working with the infant with a confirmed hearing loss and his/her family. The sharing of information among the family, audiologist, ENT, other medical specialists, and early intervention service providers (*e.g.*, speech-language pathologist, teacher of the deaf/hard of hearing, early childhood special educator) is efficient, cost effective, and most importantly, results in better outcomes for the child and family.

[1] Newborn hearing screening equipment - provides objective, physiologic, non-invasive and painless screening and testing of infant hearing. Both types of testing are accurate and reliable.

ABR – Auditory Brainstem Response: a measurement of the electroencephalographic (EEG) waves generated in response to clicking sounds. This equipment measures auditory responses at the level of the brainstem.

OAE – Otoacoustic Emission: a measurement of the sound wave, or echoes, generated by the inner ear (cochlea) hair cells in response to sound. This equipment verifies cochlear activity.

(Appendix E, Selecting Equipment)

Newborn Hearing Screening: The Role of the Primary Care Provider

Albert L. Mehl, M.D., FAAP Member, AAP Task Force on Newborn Hearing Screening

(Abridged from original article published in "*Newborn Screening News*", a publication of the Colorado Dept. of Public Health)

…Health care providers should note the following questions and answers pertaining to newborn hearing screening:

Question: What should a primary care physician do, if a newborn doesn't pass the hospital-based newborn hearing screening test? First, it is important to understand the frequency of newborn hearing loss and the accuracy of initial hospital screening. If a newborn is never screened before hospital discharge, the child has a one-in-650 chance of having an undetected congenital hearing loss. But, depending on the screening test used, the child who fails the initial screening may have a risk of confirmed hearing loss as high as one in 10! It is reasonable to reassure families that their own child may be shown to have normal hearing, but it is critical that every newborn who fails initial screening return for follow-up screening and confirmatory testing if indicated. This should be seen as a joint responsibility shared with the hospital and/or the audiology department, but nothing is as powerful as a phone call from the physician, if…the child has not returned in a timely manner.

Question: When should the child be retested? Infants should return promptly for retesting, within the first few weeks of life. The child with confirmed hearing loss should complete rescreening and confirmatory testing quickly so that early intervention, typically including amplification with a hearing aid can begin without delay. It is a reasonable goal to have every newborn with hearing loss identified by two months of age. Any delay in this process deprives the growing brain of the auditory stimulus it requires for normal development. Also, rescreening the child as an outpatient or proceeding with confirmatory testing requires a baby to be very quiet or asleep. Every month that passes decreases the likelihood that the infant will be in a quiet state at the time of the recheck appointment, and older infants may even require sedation just to perform the testing.

Questions: What diagnostic procedures are indicated? Rescreening may initially be performed with the same screening techniques used in the hospital, either otoacoustic emission testing (OAE) or automated auditory brainstem response testing (AABR). These screening tests are "physiologic" in the nature of their measurement rather than "behavioral" testing, which requires the observation of a behavioral response in the infant. Similarly, confirmatory testing must be performed using "physiologic" testing, typically including a standard Auditory Brainstem Response (ABR, also known as BAER) interpreted by an audiologist. Behavioral testing techniques are not reliable until a child is 9 to 12 months old, far too late to allow for early intervention and amplification. Most importantly, the primary care physician should make sure that all follow-up and confirmatory testing is performed by professionals with experience testing newborns, even if this requires extra travel for the infant and the family.

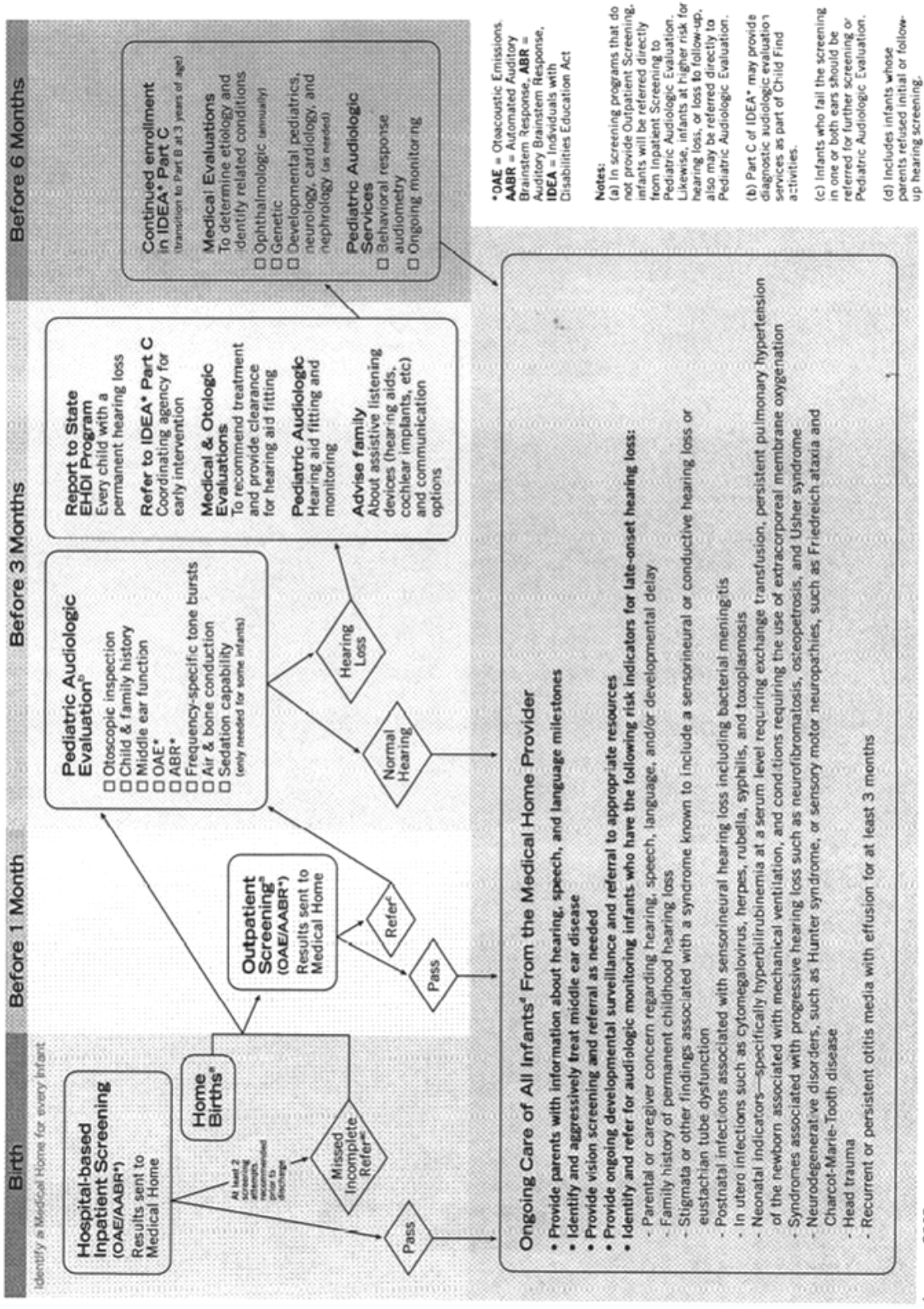
Question: What should parents be told if their newborn does not pass the hearing screening in the hospital? Most infants who do not pass the hospital-based test are eventually shown to have normal hearing. But parents should not become complacent; every baby who fails the initial screen must return for retesting. Even if the child is subsequently identified as having a congenital hearing loss, parents should know that early intervention has been shown to have dramatic results, with subsequent language development at near-normal levels.

Question: What about the child who fails the screening test in only one ear? Even though unilateral hearing loss would be a less worrisome condition than bilateral hearing loss, these infants also deserve prompt follow-up testing. If a unilateral hearing loss is confirmed, the parents can be counseled about how to maximize the child's language development by being sure that the auditory stimuli are reaching the better ear effectively. But equally important, some of these children have progression of hearing loss in the ear that initially passed screening…any child with a confirmed unilateral hearing loss must be followed closely over time to assure that the condition does not evolve into a bilateral hearing loss.

Question: If a child passes a newborn hearing screen, what else should the primary care physician do? Infants can develop permanent hearing loss after they leave the nursery. Infants who are high risk due to family history of progressive hearing loss or disorders such as cytomegalovirus [or meningitis], should be monitored audiologically every six months. Lastly, any time a parent expresses concern about a child's speech, language, or hearing, a referral should be made to an audiologist.

Question: If a child is confirmed to have congenital hearing loss, what else should the primary care physician do? Families will need help understanding this new medical development. Work closely with your audiologist to better understand the nature and degree of the hearing loss … Arrange for a complete evaluation by an otolaryngologist or otologist with experience seeing newborns; some children require further evaluation to assess for the potential of progressive hearing loss, and all require the specialist to give medical clearance for the use of a hearing aid. As we discover the increasing frequency of genetic syndromes among children with congenital hearing loss, it is recommended that these families be referred to a geneticist with experience in the field of congenital hearing loss. It is also recommended that every affected newborn have a complete evaluation by a pediatric ophthalmologist to assure that the visual stimuli to the brain are in no way compromised, and to assess for any associated eye anomalies.

Physicians have all learned to respond quickly to [other] abnormal newborn screening test[s]. It is time for physicians to respond with equal urgency when a newborn does not pass the initial hearing screening test..



Guidelines for Pediatric Medical Home Providers have been prepared by the American Academy of Pediatrics and the National Center for Hearing Assessment and Management. A copy of the Guidelines is included in the back of this book. Additional copies of the Guidelines, and copies of the following Patient Checklist, can be ordered from the AAP (website) or through Idaho Sound Beginnings.

Universal Newborn Hearing Screening, Diagnosis, and Intervention

Patient Checklist for Pediatric Medical Home Providers

Patient Name: _____

Date of Birth: ____ /___ /____

Birth

Hospital-based Inpatient Screening Results (OAE/AABR) DATE: ____ /___ /____
(also Home Births)

Left ear:	☐ Missed	☐ Incomplete	☐ Refer[a, c]	☐ Pass
Right ear:	☐ Missed	☐ Incomplete	☐ Refer[a, c]	☐ Pass

Before 1 month

Outpatient Screening Results (OAE/AABR) ____ /___ /____

Left ear:	☐ Incomplete	☐ Refer[a, c]	☐ Pass
Right ear:	☐ Incomplete	☐ Refer[a, c]	☐ Pass

Before 3 months

☐ **Pediatric Audiologic Evaluation**[b] ____ /___ /____

☐ Hearing Loss ☐ Normal Hearing

Documented child and family auditory history ____ /___ /____

☐ **Report to State EHDI Program** results of diagnostic evaluation ____ /___ /____
☐ **Refer to Early Intervention** (IDEA, Part C) ____ /___ /____
☐ **Medical & Otologic Evaluations** to recommend treatment and provide clearance for hearing aid fitting ____ /___ /____
☐ **Pediatric Audiologic** hearing aid fitting and monitoring ____ /___ /____
☐ **Advise family** about assistive listening devices (hearing aids, cochlear implants, etc.) and communication options ____ /___ /____

Before 6 months

☐ **Enrollment in Early Intervention (IDEA, Part C)** ____ /___ /____
(transition to Part B at 3 years of age)

Medical Evaluations to determine etiology and identify related conditions
☐ Ophthalmologic (annually) ____ /___ /____
☐ Genetic ____ /___ /____
☐ Developmental pediatrics, neurology, cardiology, and nephrology (as needed) ____ /___ /____

☐ **Ongoing Pediatric Audiologic Services**

Ongoing Care of All Infants[d]

☐ Provide parents with information about hearing, speech, and language milestones
☐ Identify and aggressively treat middle ear disease
☐ Vision screening and referral as needed
☐ Ongoing developmental surveillance/referral
☐ Referrals to otolaryngology and genetics, as needed
☐ Risk indicators for late onset hearing loss:

_____
(refer for audiologic monitoring)

Service Provider Contact Information

Pediatric Audiologist:
Early Intervention Provider:
Other:
Other:
Other:

(a) In screening programs that do not provide Outpatient Screening, infants will be referred directly from Inpatient Screening to Pediatric Audiologic Evaluation. Likewise, infants at higher risk for hearing loss, or loss to follow-up, also may be referred directly to Pediatric Audiologic Evaluation.

(b) Early Intervention (IDEA, Part C) may provide diagnostic audiologic evaluation services as part of Child Find activities.

(c) Infants who fail the screening in one or both ears should be referred for further screening or Pediatric Audiologic Evaluation.

(d) Includes infants whose parents refused initial or follow-up hearing screening.

OAE = Otoacoustic Emissions
AABR = Automated Auditory Brainstem Response
ABR = Auditory Brainstem Response
IDEA = Individuals with Disabilities Education Act
EHDI = Early Hearing Detection & Intervention

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American Academy of Pediatrics
DEDICATED TO THE HEALTH OF ALL CHILDREN™

NCHAM National Center for Hearing Assessment and Management Utah State University™

March 2004

GUIDELINES FOR GENETIC EVALUATION REFERRAL

The prevalence of permanent hearing loss in infants is estimated to be 2-3/1000 in the United States (Finitzo et al., 1998; Prieve et al., 2000). One or both ears may be affected. Until the 1970's when universal immunization was introduced, maternal rubella infection caused a significant proportion of congenital hearing loss. Today, about 50% of congenital and early onset hearing loss is attributable to genetic factors (Marazita et al, 1993), and considerable progress has been made in identifying genes for deafness over the last few years.

PURPOSE OF REFERRAL

The primary purpose of a genetic evaluation is to investigate the etiology of the hearing loss in order to anticipate whether the child has, or is at risk for, other medical conditions. Examination by a skilled dysmorphologist may uncover subtle indicators of a genetic syndrome. While genetic evaluation does not always pinpoint an exact etiology, it can yield important information about the hereditary nature of a hearing loss. Establishing a genetic diagnosis whenever possible is more important now than in the past. New information about the pathophysiology and natural history of the different forms of hereditary hearing loss is rapidly emerging. Therapeutic interventions to reduce the risk of complications associated with specific etiologies may someday be available.

Other important benefits of the genetic evaluation are to 1) identify other family members, particularly young siblings, who should be evaluated for possible hearing loss or associated medical conditions, and 2) provide recurrence information for family planning. A referral to a genetics center allows genetic tests to be offered in conjunction with appropriate counseling.

WHEN TO MAKE A REFERRAL

Position Statements

The Joint Committee on Infant Hearing has recommended that families be offered the option of genetic evaluation and counseling by a medical geneticist where thorough physical and laboratory investigations fail to define the etiology of hearing loss. (2000, p. 16). In a report produced for the Maternal and Child Health Bureau (MCHB) of the Federal Health Resources and Services Administration (HRSA), the American College of Medical Genetics recommends that all children with confirmed hearing loss be referred for genetic evaluation and counseling to a genetics team that typically includes a geneticist and genetic counselor. It is reasonable to refer all infants with permanent hearing loss (i.e., permanent sensorineural, conductive or mixed hearing loss) for genetic evaluation after discussion with the parent(s)/caregiver(s) about the potential benefits and limitations of the genetic evaluation and counseling process.

Prioritizing the Appointment

The Medical Home should facilitate referral for genetic evaluation as soon as possible once the diagnosis of permanent hearing loss has been confirmed, ideally by 3 months of age. It is important to prioritize the timing of the appointment in light of many other appointments the family members may have, and their adjustment to the diagnosis.

Reasons for Immediate Genetic Referral - include, but are not limited to the following:

- Suspected genetic diagnosis associated with additional health conditions.
- Parent(s)/Caregiver(s) are asking for information about the possible cause and/or want to know the chances of recurrence for family planning and appropriate medical care for other family members, especially children.
- Parental consanguinity (i.e., the parents share a common biological ancestor).
- Relative with a syndromic cause of hearing loss or other manifestations of a syndrome known to include hearing loss.
- Hearing loss in a child exposed to aminogylcosidic antibiotics (i.e., antibiotics from the -mycin group used to fight certain infections). Susceptibility to hearing loss induced by these antibiotics can be inherited.
- Need for assistance with interpretation of genetic or other test results ordered by the Medical Home or pediatric specialists.

RESPONSIBILITIES FOR THE REFERRAL PROCESS

Medical Home's Responsibilities

- Obtain a family history and past medical history to assess the urgency of genetic referral.
- Discuss the importance of a genetic referral for investigating the etiology as a basis for decisions that might affect medical and audiologic intervention.
- Refer parent(s)/caregiver(s) to a clinical genetics provider (medical geneticist or genetic counselor).
- Ensure that the Early Intervention Service Coordinator is aware of all medical implications.

Audiologist's Responsibilities

- Complete an audiologic report (**ISB Referral/Results Form)** describing the hearing loss (e.g., type, degree, and configuration) and audiologic tests performed (e.g., tympanometry, auditory brainstem response, otoacoustic emissions).
- Provide the Medical Home and with a copy of the audiologic report and recommend to the Medical Home the need for genetic referral as it relates to the overall implications for the medical and intervention management of the child.
- Counsel the family regarding the role of a genetics evaluation in determining the etiology of the hearing loss and identifying other health- related issues.

Infant Toddler Service Coordinator's Responsibilities

- Counsel the family regarding the role of a genetics evaluation in determining the etiology of the hearing loss and identifying other health- related issues.
- Ensure that the plan for intervention services takes into account any information available from genetic counseling, if known.

4. WHERE TO MAKE THE GENETIC REFERRAL

Genetic Clinic Contact Information

State of Idaho Genetic Services Program
Services: Provides clinic appointments with physician medical geneticists and a board certified genetic counselor, coordinates and interprets genetic testing, provides referrals to other genetic clinics as appropriate, and provides information on specific genetic conditions and referrals to genetic support groups.

Department of Health and Welfare
Contact: Anne Spencer, MS
Certified Genetic Counselor
2220 Old Penitentiary Rd.
Boise, ID 83712
(208) 334-2235 ext. 258
fax (208) 334-2382
email: spencera@idhw.state.id.us

Near-by State's Genetics Programs:

Depending on where the family lives, it may be more appropriate to refer them to one of these genetics programs.

Montana Medical Genetics Program,
Shodair Hospital
Helena, MT
Genetics Board Certification: Medical Genetics
(406) 444-7500
Fax: (406) 444-1022
E-mail: mtgene@shodair.org

Oregon Health Sciences University
Genetics/Birth Defects Clinic,
Portland, OR
Genetics Board Certification:
Genetic Counseling, Medical Genetics
(503) 494-8307
Fax: (503) 494-2786
E-mail: genetics@ohsu.ed

University of Utah Medical Center
Medical Genetics Clinic,
Salt Lake City, UT
Genetics Board Certification:
Genetic Counseling, Medical Genetics
(801) 581-8943
Fax: (801) 585-7252

Children's Hospital and Regional Medical Center, Seattle, WA
Medical Genetics Clinic,
Genetics Board Certification:
Genetic Counseling, Medical Genetics
(206) 528-2665
Fax: (206) 517-2495
Office Telephone: (206) 526-2056

University of Washington Medical Center, Seattle, WA
Medical Genetics Clinic,
Genetics Board Certification:
Genetic Counseling, Medical Genetics
(206) 616-2135
Fax: (206) 616-2414
E-mail: geninfo@u.washington.edu

Inland Northwest Genetics Clinic, Spokane, WA
Genetics Board Certification:
Genetic Counseling, Medical Genetics
(509) 473-7115
Fax: (509) 473-7904

Genetics References and Resources

American College of Medical Genetics. (2000). Position Statement. [On-line]. Available: http://www.acmg.net/Pages/ACMG_Activities/policy_statements_pages/current/Newborn_Hearing_Screening_Statement_on_Universal.htm

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Prieve, B., Dalzell, L., Berg, A., Bradley, M., Cacace, A., Campbell, D., DeCristofaro, J., Gravel, J., Greenberg, E., Gross, S., Orlando, M., Pinheiro, J., Regan, J., Spivak, L., & Stevens, F. (2000). The New York State universal newborn hearing screening demonstration project: Outpatient outcome measures. *Ear & Hearing*, 21, 104-117.

Genetics Website Resources

American College of Medical Genetics. Position statement on Universal Newborn Hearing Screening. http://www.faseb.org/genetics/acmg/pol-35.htm

Hereditary Hearing Loss Homepage: Papers, meeting dates and other information related to research on both syndromic and nonsyndromic hearing loss. http://www.uia.ac.be/dnalab/hhh/

Information for Genetic Professionals. This site, posted by the University of Kansas Medical Center, contains clinical, research, and educational resources for genetic counselors, clinical geneticists, and medical geneticists. http://www.kumc.edu/gec/geneinfo.html
http://www.kumc.edu/gec/glossary.html

NCHPEG. The National Coalition for Health Professional Education in Genetics is a national effort to promote health professional education and access to information about advances in human genetics. http://www.nchpeg.org

National Society of Genetic Counselors, Inc. This site provides general information about genetic counseling, as well as information about genetic counseling resources. http://www.nsgc.org/

OMIM (Online Mendelian Inheritance in Man). This database, authored and edited by Dr. Victor A. McKusick and his colleagues at Johns Hopkins and elsewhere, is a catalog of human genes and genetic disorders. It was developed for the World Wide Web by the National Center for Biotechnology Information. http://www3.ncbi.nlm.nih.gov/omim

GUIDELINES FOR INFANT AUDIOLOGIC ASSESSMENT

One goal of Idaho's Early Hearing Detection and Intervention (EHDI) Program is to ensure newborn hearing screening is provided at all birth facilities in the state prior to discharge. Depending on the individual facility's screening protocol, infants who have an *abnormal* inpatient or outpatient rescreening will be referred to a pediatric audiologist for a *Diagnostic Audiologic Assessment*. The goal of the EHDI program is to have infants with hearing loss –

Screened by **one** month of age,

Diagnosed by **three** months of age, and

Enrolled into early intervention services by **six** months of age.

To aid in this process, ***Idaho Sound Beginnings*** **(ISB)** has developed a set of guidelines for Infant Auditory Assessment to reflect the current standards of practice for performing a pediatric diagnostic test battery on children from birth through twelve months of age.

The following guidelines are based on current state practice, the recommendations of the Joint Committee on Infant Hearing Year 2000 Position Statement, the Policy Statement of the American Academy of Pediatrics, and guidance available from the National Center for Hearing Assessment and Management (NCHAM) www.infanthearing.org .

SITE REQUIREMENTS

- Infants and young children should be referred to Audiologic Assessment sites having the capacity to perform the full diagnostic assessment battery as listed below.
- It is recommended that audiologists who conduct Audiologic Assessments for the pediatric population have adequate experience in evaluating newborns and very young infants to prevent any delay in diagnosis and intervention.

AUDIOLOGIC ASSESSMENT BATTERY

A. **Case History**: Obtain a complete case history containing parent/caregiver report of emerging communication and auditory behaviors.

B. **Otoscopy**: Perform an otoscopic examination of the ears.

C. **Diagnostic Auditory Brainstem Response (ABR) Evaluation includes**:

i. High intensity click stimulus (70-80 dBnHL) to assess latency and morphology of Waves I and interwave intervals of Waves I – III, III-V, and I-V.

ii. Threshold search, click stimulus (30 dBnHL ≤ 6 months, 25 dBnHL ≥ 6 months)

1. An infant exhibiting **norma**l responses to click stimuli in each ear shall be considered discharged.

2. *If click ABR is* ***abnormal***, perform:

- **Frequency specific ABR**, at least one low and one high frequency (e.g. 500-4000 Hz). Hearing loss is defined as an average of the frequencies 500 Hz.

- 2000 Hz, and 4000 Hz; or the hearing level of any two of these frequencies greater than or equal to 30-35 dBnHL (JCIH 2000).
- **Middle ear evaluation** to include one or both of the following:
    1. Bone conduction ABR (If air and bone conducted wave V threshold is 20 dB or more, the presence of conductive pathology should be suspected.
    2. Tympanometry utilizing a high frequency probe tone (i.e. ≥ 660 Hz).
    3. Acoustic Reflexes.
- **Diagnostic Otoacoustic Emissions (OAE's)** NOTE: may not be able to obtain low frequency emissions due to high noise floor.
- **Developmentally appropriate Behavioral Testing:** If the child is at least six months developmental age, awake, and alert; attempts should be made to obtain ear specific thresholds at 500-4000 Hz.
- **Auditory Neuropathy Evaluation:** If results indicate abnormal ABR with present OAE's, or absent ABR – regardless of OAE results.
    1. ABR Click (air conduction) 80-90 dBnHL, with rarefaction and condensation waveforms, averaged separately to look for Cochlear Microphonic.

RESULTS

Report results to the ISB/EHDI Program via completion of the 'Audiologic Results' side of the **ISB Referral Form**. (Appendix B, ISB Reporting Forms)

(If the child does not have a hospital completed Referral Form, blank forms can also be obtained from Idaho Sound Beginnings, or on the website- www.state.id.us/cdhh .)

A. **Children without Hearing Loss**:

i. Discuss test results with the parents/caregivers. Include information on acquired, delayed onset, and progressive hearing loss and the need to monitor.

ii. Provide with written speech, language, and hearing milestones.

iii. Prepare a complete and concise report of test results, recommendations, and referrals, and provide a copy to the family.

iv. Indicate all results, and any risk indicators and/or monitoring recommendations on the **ISB Referral/Results Form.**

v. Report results to the Medical Home and ***Idaho Sound Beginnings*** using the **ISB Referral/Results Form**.

vi. JCIH recommends audiologic monitoring at 6 month intervals until age 3 years for any child "at risk."

B. **Children <u>with</u> Hearing Loss**:

i. Discuss test results with the parents/caregivers.
ii. Prepare a complete and concise report of test results, recommendations and referrals and provide parents with a copy.
iii. Report results to the Medical Home and ***Idaho Sound Beginnings*** using the **ISB Referral/Results Form**.
iv. Counsel parents/caregivers on the effects of hearing loss, communication, and the need for immediate intervention.
v. Provide parents with a copy of "*Help and Hope: Family Resource Guide*." *
vi. Refer parents to the Idaho Infant Toddler Program within 2 working days.*
vii. Refer parents to **Idaho Hands & Voices** family support group.*
viii. Schedule audiologic follow-up monitoring to include age-appropriate behavioral testing.

AMPLIFICATION

A. If bilateral/unilateral hearing loss of 30-35 dBnHL or greater is detected, a hearing aid evaluation and fitting should be completed as soon as possible, before six months of age.
B. Estimates of hearing loss and the fitting of amplification should be based on frequency specific evoked potentials and OAE information.
C. A pediatric specific prescriptive formula should be used to set the gain and output of the hearing aids.
D. Hearing aid performance should be verified by real-ear measurements.

Please refer to the American Academy of Audiology Pediatric Amplification Protocol and Guidelines, October 2003, available on-line at:

www.audiology.org/professional/positions/pedia-rehab.php

RECOMMENDED READING

Cone-Wesson, B & Ramirex, G.M., (1997). Hearing sensitivity in newborns estimated from ABRs to bone-conducted sounds. *Journal of the American Academy of Audiology*, 8, 299-307.

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*(See Appendix F, Resources**,** or contact Idaho Sound Beginnings for further information.)

GUIDELINES FOR EARLY INTERVENTION

Early intervention is essential for all children who are diagnosed as deaf or hard of hearing to ensure them the opportunity to grow, learn, communicate and develop fully. All babies need to learn an incredible amount in the first few months and years of life; those with hearing loss require special assistance early in life so that they can develop to their potential.

The current federal law on providing early intervention services is The Individuals with Disabilities Education Act (IDEA), Part C, amended in 1997 by Public Law 105-17. Idaho state law authorizes early intervention services for children with disabilities. The **Infant Toddler Program** in the Idaho Department of Health and Welfare (DHW) manages the provision of early intervention services.

The **Infant Toddler Program**, a state-wide resource, provides a variety of therapeutic, educational and supportive services to help both the child and his or her family. The DHW Regional **Child Development Centers** provide services locally. (Appendix F, Resources)

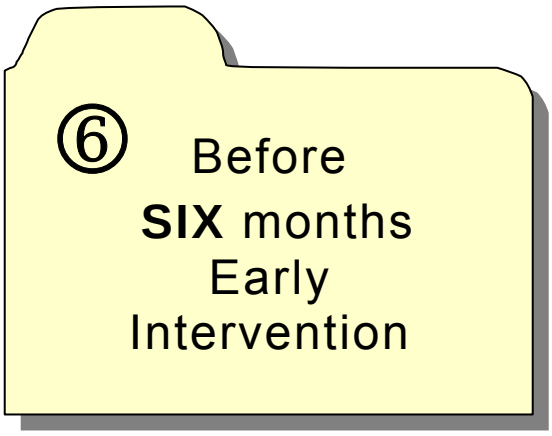
Child Development Centers –

- May provide hearing screening for infants who are 'missed', 'born out of hospital', or need follow-up screening.
- Should complete an **ISB Referral Form** for any infants screened at their site, and distribute the form to Idaho Sound Beginnings and others according to instructions on the form. (See Appendix B, ISB Reporting Forms)
- Should refer families to their local hospital, or audiologic testing site for newborn hearing screening if a trained infant screener is not available at the Center.
- May contact Idaho Sound Beginnings for help in obtaining skills training in infant hearing screening from an audiologist.

Many of the early intervention services for children who are deaf or hard of hearing are provided in collaboration with Parent/School Advisors from the regional outreach programs of the **Idaho School for the Deaf and the Blind (ISDB).**

GOALS OF EARLY INTERVENTION FOR BABIES WHO ARE DEAF OR HARD OF HEARING:

- Give babies who are deaf or hard of hearing access to communication and the opportunity to develop language skills.
- Help babies who are deaf or hard of hearing become fully participating members of the family and later the community.



Children who are early identified and receive intervention prior to six months of age have significantly better receptive language, expressive language, personal-social skills, receptive vocabulary, expressive vocabulary and speech production.

Christine Yoshinaga-Itano, PhD

HOW EARLY INTERVENTION WORKS FOR BABIES WHO REFER FOR AUDIOLOGIC EVALUATION

- When a referral is received by Regional Early Intervention Specialists concerning an infant with some level of hearing loss, intervention services begin promptly.
- The family is contacted by an Early Intervention Specialist who is part of a team of professionals, including an audiologist, communication therapist, primary care provider, an advocate of the parents' choice, and most importantly – the family.
- If an evaluation determines eligibility, the infant's team works together with the family to develop an **Individual Family Service Plan** (IFSP) within 45 days, as required by law.
- One or more of the services listed below must be provided by the **Infant Toddler Program,** when the child is eligible:

  Hearing services;
  Speech/language therapy;
  Referral to Idaho School for the Deaf and Blind;
  Referral to Idaho Hands & Voices, the statewide parent-to-parent support system;
  Developmental evaluation and therapy;
  Limited financial services;
  Physical &/or occupational therapy;
  Nutrition services;
  Social work services;
  Family education;
  Vision services;
  Assistive technology;
  Health services;
  Nursing services;
  Diagnostic medical services;
  Respite care;
  Psychological services;
  Service coordination;
  Transportation services;
  Other professional services.

- Service coordination will be provided by the Family Service Coordinator or Early Interventionist. This relationship with the family becomes a central point of contact between the family and/or other professionals. As additional needs are identified, the family will be referred to such supports as:

  An Assistive Technology specialist;
  Occupational or Physical Therapy;
  Sign Language Classes or other resources.

DEFINITIONS

Audiologist- a professional who holds a masters or doctoral degree with special training in identification, measurement, and rehabilitation of persons with a hearing loss. A *Pediatric Audiologist* is trained to provide services to the pediatric population.

Auditory Brainstem Response (ABR)- an objective, non-invasive, painless test that measures auditory responses at the level of the brainstem in response to auditory stimuli. This test can indicate whether or not sound is being detected, even in an infant.

Automated Auditory Brainstem Response (AABR)– auditory brainstem response hearing screening equipment which automatically provides a pass/refer outcome.

Bilateral hearing loss – hearing loss in both ears.

Child Development Center (CDC) – Idaho's seven regional centers where Infant Toddler early intervention services are provided. (Department of Health and Welfare)

Conductive hearing loss – hearing loss due to the failure of sound waves to reach the inner ear through the normal air conduction channels of the outer and middle ear. In children, it is often temporary or medically correctable, and is most often associated with Otitis Media.

Congenital hearing loss – hearing loss present at birth or associated with the birth process, or which develops in the first few days of life.

Department of Health and Welfare (DHW) – lead agency for Idaho Infant Toddler.

Diagnostic audiologic evaluation-a comprehensive evaluation of hearing which identifies the type and degree of hearing loss. The testing can also assess how well a child is hearing with amplification (hearing aids).

Discharge – release from the hospital after birth to the care of the parent/caretaker.

Early Intervention – services designed to meet the developmental needs of each child identified with a disability and enhance their development through the provision of family centered care.

Follow-up – appropriate and timely referrals, services, and procedures for infants with any refer results or risk indicators.

Genetic Counseling – includes recurrence risk information for individuals with hearing loss and their families.

Hearing loss – a dysfunction of the auditory system of any type or degree that is sufficient to interfere with the acquisition and development of speech and language skills It may be mild, moderate, or severe - Sensorineural, conductive, or mixed.

Hearing Screen – an objective physiological measure completed in order to identify individuals with potential hearing loss and refer them for further testing. Automated OAE or ABR equipment (pass/refer results) is commonly used for the hearing screening.

High risk – having a significant probability of having or developing hearing loss as a result of the presence of one or more risk indicators identified or manifested at birth.

Hi-Track (***HT***)– hospital and state patient information tracking and data management software used by Idaho's newborn hearing screening programs.

Individual Family Service Plan (***IFSP***)– a written plan for serving each disabled child, age 0 to 3, outlining what services are needed by the child, how they will be provided, and by whom.

Infant Toddler Program – a statewide community based program, which identifies infants and toddlers who have a developmental delay or disability, or conditions which lead to such a delay or disability; and which provides early intervention services to meet the needs of these children and their families. The Department of Health and Welfare is the lead agency for the Infant Toddler program; services are provided through the seven regional Child Development Centers.

Initial screen – inpatient hearing screening conducted prior to hospital discharge.

ISB – Idaho Sound Beginnings

ISDB – Idaho School for the Deaf and the Blind

Missed screen – the initial/ inpatient screen was not conducted prior to discharge.

Mixed hearing loss –a combination of conductive and sensorineural hearing losses.

NCHAM – National Center for Hearing Assessment and Management

Newborn Hearing Screening (NHS) – objective physiologic testing of infant auditory function to determine the need for further audiologic assessment to rule out or confirm the presence of a hearing loss.

Otoacoustic Emissions (OAE) - an objective audiologic test that verifies cochlear activity. It is often used in screening infants for hearing loss.

Outpatient hearing screen – any hearing screening conducted as an outpatient; usually a repeat hearing screen conducted on the ear(s) which did not pass the initial screening, but may also be an initial screen, when there was no screen before discharge.

Rescreen – a repeat hearing screen conducted only on the ear(s) which did not pass the initial screening. (usually done as an outpatient when OAE equipment is used, but with AABR equipment the rescreen may be conducted prior to discharge)

Responsible Party – parent or guardian, person(s) legally responsible for the care of the child, i.e. in the case of adoption, this may be the agency social worker.

Risk indicators – factors which have been shown to be associated with a higher incidence of progressive or late-onset hearing loss.

Sensorineural hearing loss –a type of hearing loss (usually irreversible) caused by damage that occurs to the inner ear (cochlea) and/or the auditory nerve.

Unilateral hearing loss – *hearing loss in one ear.*

References

American Academy of Pediatrics. (1999). Newborn and Infant Hearing Loss: Detection and Intervention, American Academy of Pediatrics Task Force on Newborn and Infant Hearing. *Pediatrics,* 103 (2), 527-530.

American Academy of Pediatrics. (2002) Policy Statement: The Medical Home. *Pediatrics,* 110(1) 184-186. http://www.medicalhomeinfo.org/resources/general.html

American Academy of Pediatrics. (2003) Clinical Report: Hearing Assessment in Infants and Children: Recommendations Beyond Neonatal Screening, *Pediatrics*, 111 (2) 436-440. http://pediatrics.aappublications.org/cgi/content/full/111/2/436

Americans with Disabilities Act. (2000). [On-line]. Available: http://www.usdoj.gov/crt/ada/publicat.htm

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Early Hearing Detection and Intervention Program Guidance Manual, (2003), Department of Health and Human Services, Centers for Disease Control and Prevention, Atlanta, GA.

Arizona Hospitals' Universal Newborn Hearing Screening 2001 Guidelines, Arizona Department of Health Services.

Guidelines for Newborn Hearing Services, (2002), MADHS-Coalition for Deaf and Hard of Hearing People, Early Identification Sub-committee, Lansing Michigan.

Universal Newborn Hearing Screening Program Birthing Facility Guidelines, (2000), Keeping Connecticut Healthy, Family Health Division, State of Connecticut, Department of Public Health.

APPENDICES:

A. Speech and Language Development

a. Hearing Milestones

b. The Impact of Early Identification of Hearing Loss

c. Screeners Guide: How to respond to frequently asked questions.

B. ISB (Idaho Sound Beginnings) Reporting Forms:

a. ISB Referral Form – "Referral for Audiologic Rescreening and/or Diagnostic Evaluation" and "Instructions for Hearing Screening Personnel"

b. ISB Results Form – "Results of Diagnostic Audiological Evaluation" and "Instructions for Audiologists"

C. Pediatric Audiology Network and Guidelines

D. Risk Indicators for Progressive and Late-Onset Hearing Loss

E. Selecting Equipment

F. Resources and Contacts

G. Order Form for ISB forms and brochures

H. Skills Checklists for Screeners

I. Hi-Track Training Outline

For information or materials not included here contact Idaho Sound Beginnings or check the website: www.state.id.us/cdhh/ehdi

Can Your Baby Hear You?

♫ ♫ ♫

Speech, Language and Hearing Milestones

Here is a list of some things a child with normal hearing should be able to do

Talk to your doctor if you answer No to any of these questions:

Yes	No	**Birth to Three Months** ♥
___	___	Startles to loud sounds
___	___	Quiets to familiar voices
___	___	Turns head to you when you speak
___	___	Smiles when spoken to
		Three to Six Months of Age ♥
___	___	Looks for sounds with eyes
___	___	Starts babbling
___	___	Uses a variety of voice sounds, such as squeals, whimpers, chuckles
___	___	Enjoys rattles and other toys that make sounds
___	___	Becomes scared by a loud voice
		Around Six Months of Age ♥
___	___	Babbles (“ba-ba,” “ma-ma,” “ga-ga”)
___	___	Turns head toward sound
___	___	Begins to imitate speech sounds
		Around Nine Months of Age ♥
___	___	Imitates speech sounds of others
___	___	Understands “no-no,” or “bye-bye”
___	___	Turns head toward soft sounds
___	___	Starts to respond to requests such as “come here”
		Around Twelve Months of Age ♥
___	___	Correctly uses “ma-ma,” or “da-da”
___	___	Gives toy when asked for
___	___	Responds to singing or music
___	___	Locates sounds of all types and levels
___	___	Plays with own voice, enjoying the sound of it
		15 to 18 Months ♥
___	___	Uses words he/she has learned often
___	___	Enjoys being read to
___	___	Comments, points to objects, vocalizes or uses word approximations

Information about Hearing Loss and the Benefits of Early Identification

Hearing Loss is the #1 birth defect; 20x more common than PKU.

Hearing Loss is invisible; deaf and hearing babies can look the same.

Deaf and hearing babies both make sounds.

As many as 63 babies with hearing loss are born every year in Idaho.

90% of infants with hearing loss are born to hearing parents.

Over 50% of children with hearing loss have no risk factors.

Undetected hearing loss has serious negative consequences.

Early intervention before 6 months of age provides improved communication outcomes.

There are dramatic benefits associated with early identification of hearing loss, but any delay in diagnosis may delay speech and language development.

Babies who have hearing loss can be helped in many ways to develop their full potential. A ground-breaking study of children who were deaf and hard of hearing, by Christine Yoshinaga-Itano at the University of Colorado, concluded that children who received interventions before six months of age had significantly better language scores than those receiving intervention after six months. Some of the research findings included:

The benefits of early identification and intervention (prior to six months) can be demonstrated from 12 months of age through seven years of age.

Children who are early identified and receive intervention prior to six months of age have significantly better receptive language, expressive language, personal-social skills, receptive vocabulary, expressive vocabulary and speech production.

Cognitive abilities and language abilities are similar for children who are early identified with early intervention regardless of whether their skills fall within the normal or significantly delayed range.

Late–identified children have developmental language quotients which remain at fifty to sixty percent of their chronological age throughout their early childhood period.

Language development of children who are early-identified with early intervention does not differ by degree of hearing loss, from mild through profound.

The language development of children with later-identified hearing loss does differ significantly by degree of hearing loss.

Children with mild, moderate, moderate-severe, severe and profound hearing losses benefit from early identification and intervention.

Early babbling of deaf and hard-of-hearing infants does not predict later speech intelligibility.

Babbling at twelve months of age is predicted by degree of hearing loss and also predicts later speech intelligibility.

Degree of hearing loss is the most powerful predictor of later speech intelligibility.

Parents of early-identified children report significantly less stress than parents of later-identified children.

Yoshinaga-Itano, Christine, PhD, *Early Identification and Intervention: It Does Make a Difference!*, Audiology Today, 11 Infant Hearing Screening.

Moeller, M.P.(1997) Boys Town National Research Hospital Study of Earlier vs. Later.

The National Center for Hearing Assessment and Management, Utah State University.

American Academy of Pediatrics.

Screener's Guide

An Audiologist's suggestions for how to respond to frequently asked questions:

Q: "Why are you testing my baby for hearing loss?"

A: It is best to find out if there is a hearing loss in your child as early as possible. It is important to identify any hearing loss before 6 months of age in order to prevent delays with speech and language development

Q: "What does it mean if my baby has PASSED the hearing screening?"

A: Your baby has passed the hearing screen at this time. Here is a list of developmental milestones for speech, language, and hearing. If there is a family history of *childhood* hearing loss, or if you have concerns at any time about speech, language, or hearing, be sure to discuss these with your pediatrician or and audiologist. (Do not say that hearing is "normal;" – remember, this is just a screening.)

Q: "Does this REFER mean my baby has a hearing loss?"

A: This test is just a screening. I can't interpret results from this test today. There are other reasons you baby may not have passed; hearing loss is certainly one reason, but there may also be fluid, vernix or debris preventing the baby from hearing as he/she should, and this needs to be re-checked and/or evaluated by an audiologist. (Never give a diagnosis)

Q: "What is the Audiologist going to do?"

A: He/She will perform a full diagnostic evaluation. Testing will be done to determine what level of sound the baby is hearing in each ear. Speech sounds are made up of a range of tones. Testing will help determine the softest sounds that produce a response for low, middle, and high pitched sounds. Before 2 months of age, testing can usually be done while the baby is sleeping naturally.

Q: "But I KNOW my baby can hear. Why do I need to go to an Audiologist?"

A: Remember, there are varying degrees of hearing loss, so a child with hearing loss can startle, or respond to other sounds, but may still have a hearing loss that would cause delays in speech and language. Making loud noises is not an accurate way to test hearing. Diagnostic testing by an Audiologist will determine if hearing loss is present for any of the different pitches of sound.

Q: "What if my baby does have hearing loss?"

A: There are many different types and degrees of hearing loss. The Audiologist can go over this information with you and talk about options if there is hearing loss. Much can be done to enhance your baby's language learning and communication development if hearing loss is identified early.

IDAHO SOUND BEGINNINGS

REFERRAL FOR AUDIOLOGIC RESCREENING AND/OR DIAGNOSTIC EVALUATION

HOSPITAL: _____Today's Date: _____
BABY'S NAME: _____(M)____(F)____**DATE OF BIRTH:** _____
Mother's Last Name (if different from baby's):_____

- **BABY'S HOSPITAL MEDICAL RECORD #:** ☐
- **RESULTS**: Inpatient Screen - R_____ L_____ Screening Method: ABR _____ OAE_____
  Outpatient Re-Screen- R_____ L_____ Date of Re-Screen:_____
- **BABY'S PRIMARY PHYSICIAN**: _____
- **PARENT/GUARDIAN**:
  Name:_____
  Address:_____
  City:_____ State:_____Zip:_____
  Phone: _____
- **AUDIOLOGIST/CLINIC REFERRED TO:**
  Name:_____
  Address:_____
  City:_____ State:_____Zip:_____
  Phone:_____
  DATE OF DIAGNOSTIC EVAL. (if known):_____

RISK INDICATORS:

___Family History (Permanent Childhood Hearing Loss)
___Gestational Age < 32 weeks
___Syndrome Associated with HL
___Low Birthweight (<3.3 lbs.)
___Congenital Infection (e.g. T-O-R-C-H)
___Postnatal Infection (e.g. Meningitis)
___Hyperbilirubinemia (requiring transfusion)
___Craniofacial Abnormalities
___Low Apgar Scores (<4/1 or 6/5)
___Mechanical Ventilation> 10 days
___Ototoxic Medications
___Other _____

Information on financial assistance for the audiologic evaluation can be obtained by calling the Idaho Care Line at 211 or 800-926-2588 (voice), 208-332-7205 (TTY).

I hereby give permission to the staff of the above-named hospital to release **medical** information necessary to complete an audiological evaluation for my child to the above-named audiologist/clinic (or the audiologist of my choice) and physician. I also give permission to the above named hospital and audiologist/clinic to share information about the results of the hearing screening and diagnostic audiologic evaluation with the staff at my child's birth hospital, the above–named physician, the Idaho Infant-Toddler Program, the Idaho Early Hearing Detection and Intervention Project (EHDI), Idaho School for the Deaf and Blind, and Idaho Hands & Voices. I understand that the information will be used to ensure that appropriate and timely medical, educational, and audiologic services are made available to my child. The hospital staff has informed me of my baby's hearing screen results and of the need for either a re-screen or further diagnostic audiological evaluation.

I have had the opportunity to read this hospital's Notice of Privacy Practices. I understand that this information will not be shared with unauthorized individuals. This authorization expires 36 months from the date signed.

- **PARENT/GUARDIAN:_____ Date:_____**
  (Signature required)

TO THE SCREENER: Please return this form within 10 days* of referral date to:

Idaho Sound Beginnings (EHDI) Project
1720 Westgate Dr., Boise, ID 83704
(208) 334-0983, (800) 433-1323 or FAX: (208) 334-0952

DISTRIBUTION: **White**-Audiologist, **Gold**-EHDI Project **,** **Yellow**-Physician, **Pink**-Hospital, **Green**-Parent(s)

(If baby does not return for Outpatient Re-Screen, form is to be distributed within 30 days of Inpatient Screen Date)

Instructions for Hearing Screening Personnel:

"Idaho Sound Beginnings Referral Form"

(FOR AUDIOLOGIC RESCREENING AND/OR DIAGNOSTIC EVALUATION)

AFTER THE FIRST (INPATIENT) SCREEN:

- The hospital screener completes the front page of the *"Referral for Audiologic Rescreening and/or Diagnostic Evaluation"* as soon as the baby does not pass the hearing screening, OR if any risk indicators are present.
  - **The parent's signature is obtained AT THIS TIME.**
  - Hospital retains copies. (Hospitals may prefer to give parents the green copy of the signed form at this time)

AFTER THE RE-SCREEN:

- If baby does not pass the re-screen, OR if any risk indicators are present - *form is distributed, by hospital personnel*, as follows-
  - **YELLOW** copy is mailed/faxed to the baby's physician within 10 days. If the baby did not pass the rescreen, a phone call requesting authorization/referral for Diagnostic Audiological Evaluation should also be made at this time.
  - **WHITE** copy is mailed/faxed within 10 days to the Audiologist to whom the baby was referred for testing.
  - **GOLD** copy is mailed/faxed within 10 days to the Idaho Sound Beginnings/Early Hearing Detection & Intervention (EHDI) Project. (**Fax # 208-334-0952**)
  - **PINK** copy is retained by the hospital.
  - **GREEN** copy is given to parents (if not already given to parents after first screen).

WHEN THERE IS NO RE-SCREEN:

- If baby does not return for re-screen within one month of initial screening date, **YELLOW**, **GOLD**, and **PINK** copies of form should be distributed as above (see: 'AFTER THE RE-SCREEN'). GREEN (parent's) copy should also be distributed, if it was not given to the parent after the first screen.

▸ WHAT HAPPENS AFTER THE NEWBORN HEARING SCREENING: ◂

The Audiologist completes the "Results" portion on the back page when the Diagnostic Evaluation is completed; the Audiologist then mails or faxes the completed form and results to the Idaho Sound Beginnings/EHDI Project and to the baby's physician.

Idaho Sound Beginnings/EHDI Project uses the *gold* copy of the referral form to track high-risk infants and infants who don't return to the hospital for a re-screen; and to facilitate Diagnostic Evaluations and appropriate Early Intervention. **It is essential that the form is SIGNED, information on both sides of the form is accurate and complete, and the baby's MEDICAL RECORD # is included.**

If you have any questions regarding how to use the form, please contact the Idaho Sound Beginnings/EHDI Project offices at (800) 334-0829 or Fax # 208-334-0952.

PLEASE NOTE: IN ORDER FOR THE FORMS TO BE LEGIBLE, PLEASE PRESS DOWN HARD WITH PEN.

IDAHO SOUND BEGINNINGS - RESULTS OF DIAGNOSTIC AUDIOLOGICAL EVALUATION

BABY'S NAME:_____ **M( ) F( ) DATE OF BIRTH**:_____

Mother's last name (if different from baby):_____ **BIRTH HOSPITAL:**_____

DIAGNOSIS: **DATE OF DIAGNOSTIC EVALUATION:**_____

Type of Loss:	Right	Left		Right	Left	**Degree of Loss:**	Right	Left
Normal Hearing -	____	____	Undetermined	____	____	Normal -	____	____
Conductive Loss -	____	____	Not Required	____	____	Mild -	____	____
Sensorineural Loss-	____	____				Moderate -	____	____
Mixed Loss -	____	____				Severe -	____	____
Central Loss - (e.g.-Auditory Neuropathy)	____	____				Profound -	____	____

RESULTS:

ABR: Click – Wave V dBnHL

Air - Right_____ Left_____

Bone - Right_____ Left____

ABR: Tone – (kHz)	.5	1	2	4
Air – Right	____	____	____	____
- Left	____	____	____	____
Bone – Right	____	____	____	____
- Left	____	____	____	____

TYMPANOMETRY: Hz-_____

Type - Right_____

(e.g. A) Left _____

OAE:	Right	Left	
TEOAE_____	____	____	Pass
DPOAE_____	____	____	Refer
	____	____	Could not test
	____	____	Not Required

BEHAVIORAL: BOA_____, VRA_____, CPA____

(kHz) - .5	1	2	3	4	6	8	- **Speech**
Right ___	___	___	___	___	___	___	___ dBnHL
Left ___	___	___	___	___	___	___	___ dBnHL
Sound Field ___	___	___	___	___	___	___	___ dBnHL
Bone ___	___	___	___	___	___	___	___ dBnHL

RECOMMENDATIONS:

___Medical Follow-up

___ENT Consult/Clearance

___Referred to ID Hands & Voices (800) 433-1323

___ID Infant Toddler/Early Intervention Services (800) 926-2588

___Audiological Re-Evaluation and/or Monitoring -

(if yes) When/How often? _____

___Amplification

___Genetic Counseling

___NONE

COMMENTS:

RESULTS COMMUNICATED TO: ___Child's Physician ___ Idaho Infant Toddler Program

___ISDB (School for the Deaf/Blind) ___Other_____

_____ _____ _____

Audiologist Signature Clinic Name Phone / Fax

_____ _____

Address City State Zip e-mail

Audiologist: Return this form with your report within 10 days of referral date to:

Idaho Sound Beginnings (EHDI) Project
1720 Westgate Dr., Suite A Boise, ID 83704
PHONE: (208) 334-0983, (800) 433 –1323 *or FAX: (208) 334-095*

"Results of Diagnostic Audiological Evaluation"

Attn: Audiologists

Instructions for Completing

I. <u>Original White Copy:</u>

The Audiologist receives the original *white* copy of the "Referral for Diagnostic Audiological Evaluation" as notification of a child needing Diagnostic Evaluation.*
(The hospital screener is responsible for completing and distributing the original "Referral" to the baby's physician, audiologist, parents, and Idaho Sound Beginnings, when a child fails 2 screens)
(*If you see a child for whom you have **not** received a *white* "Referral for Diagnostic Audiological Evaluation" form, see item number III.)

II. <u>Documenting Results</u>:

Identifying Information: Important for tracking and follow-up.

Diagnosis: Record both the Type and Degree of loss for each ear.

Results: Indicate *all* tests performed at the Diagnostic Evaluation.

Recommendations: Place a checkmark beside each recommendation you made to the parents and the baby's physician.

Results Communicated: Indicate all agencies that received notification if the child was identified with hearing loss or as needing periodic monitoring.

Signature: Sign and complete the contact information.

III. *<u>**When no white "Referral" form has been received**</u>, the Audiologist will use the <u>**Buff Colored**</u> Report form and proceed as in part II.

The Buff colored form is to be used by the Audiologist when:

1. Evaluating a child referred from an NHS program without the original, hospital Completed, "Referral" form.
   or….
   Any child under the age of 3 years newly identified with <u>sensorineural</u> hearing loss.

*(This is for the purpose of tracking the prevalence of late-identified and late-onset hearing loss in children, as well as **assuring their enrollment with early intervention services.**)*

2. <u>Have parents sign release</u> and give them a copy of the form.

IV. When a child is diagnosed with deafness or hearing loss:

*Please provide family with a copy of **"Help and Hope"** parents' resource manual, and refer them to **"Idaho Hands and Voices"** parent support group (<u>800-433-1323</u>)*

Mail or fax results within 10 days to:

Idaho Sound Beginnings Project (Fax 208-334-0952)

1720 Westgate Drive, Suite A Boise, ID 83704

Phone: 208-334-0983, 800-433-1323

GUIDE TO PEDIATRIC AUDIOLOGICAL SERVICES

This list was developed as a result of the Audiologists' responses to a survey sent by Idaho Sound Beginnings, designed to determine the level of hearing care that each Audiologist is able and willing to provide to **pediatric populations**. Audiologists are professionals with Masters (M.S., M.A., MCD) or Doctoral degrees (Ph.D., Au.D.) that specialize in hearing care. Audiologists are qualified to diagnose hearing loss and dispense hearing aids. Audiology services include hearing screening, diagnostic testing that goes beyond screening measures (ABR, OAE), tympanometry (middle ear assessment), behavioral testing (visual reinforcement or conditioned play audiometry), and hearing aid dispensing.

This list is organized into two categories; Audiologists that provide (A) 'Comprehensive' or (B) 'Limited' pediatric audiological services.

A) Comprehensive Audiological Services:

Can test all ages - Can perform full range of pediatric diagnostic audiology - Can select and fit appropriate amplification for all ages (Call the Center or Audiologist for specifics)

Boise, ID	Audiology & Hearing Aid Center	3320 N. Milwaukee 125	83704	208-658-0238	(Cynthia Olsen, MCD, CCC-A)
	Hearing & Balance Centers at Elks	600 N. Robbins Rd.	83702	208-489-4999	(Mike Sturmak, MS CCC-A; Lynn Reese, MS CCC-A; Shannon Gower, MS CCC-A; Erika Blanchard, MS CCC-A)
	Southwest Idaho ENT	900 N. Liberty 400	83704	208-367-7429	(Dean Harmer, PhD; Rebecca Bishop, MS CCC-A; Alison Ediger, MS CCC-A)
	Treasure Vly. Hearing & Balance Clinic	1084 N. Cole Rd.	83704	208-672-9201	(Curtis Whitcomb, MS CCC-A)
Meridian, ID	Hearing & Balance Centers at Elks	520 S. Eagle Rd. 1225	83642	208-888-0026	(Kathleen Wachtler, AuD. CCC-A; Deborah Baerlocher, AuD CCC-A; Clair Ketchum, MA CCC-A)
Nampa, ID	Hearing & Balance Centers at Elks	220 10th Ave. South	83651	208-461-5615	(Rebecca Pixley, MS CCC-A; Laurie Conlin, MA CCC-A)
Pocatello, ID	Idaho State University	Campus Box 8116	83209	208-282-3495	(Mary Whitaker, MS CCC-A; Ron Schow, PhD; Randy Bishop, MS CCC-A)
Twin Falls, ID	Snake River ENT	630 Addison W. #240	83303	208-735-1000	
	Trinity ENT	1330 Filer Ave. East	83303	208-324-4414	(Joe Seitz, MS CCC-A)
	Dr. Nicholson, ENT	496 Shoup Ave. W.- A	83301	208-732-3066	(Jay Lloyd, MS CCC-A)
Missoula, MT	Ft. Missoula Hearing Center	2831 Ft. Missoula Rd 300	59804	406-542-5200	(Ruth Fugelberg, MS CCC-A)
Logan, UT	Utah State University	1000 Old Main Hill	84322	435-797-2670	(Ken Curtis, MS CCC-A)
Spokane, WA	Spokane ENT	217 W. Cataldo	99164	509-624-2326	(Kami Fehlig, MS CCC-A)
	Washington State University	PO Box 1495	99210	509-358-7580	(Barbara Peregoy, MS CCC-A) Jeff Nye, MS CCC-A)

B) Limited Audiological Services: *May not have facilities to test all ages - Does not perform the full range of diagnostic audiology- (may not have OAE's or ABR's) - May not fit amplification on young children*
(Call the Center or Audiologist for specifics)

Boise, ID	Boise Speech & Hearing	6700 Emerald St.	83704	208-376-3591	(Brent Bowman, MS CCC-A; Brek Stoker, MS CCC-A)
Chubbuck, ID	The Hearing Zone	4155 Yellowstone 1260	83202	208-238-0020	(Kelley Olenick, MS CCC-A; Caroline Kerr, MS CCC-A)
Coeur D'Alene, ID	Audiology Research Assoc.	700 Ironwood Dr. 228	83814	208-765-4961	(Clixie Larson, MS CCC-A; Yancie Kidd, MS CCC-A
Gooding, ID	Idaho School for the Deaf & Blind	1450 Main St.	83303	208-934-4457	(Gayle Chaney, AuD CCC-A)
Idaho Falls, ID	Child Development Center	2475 Leslie Ave.	83402	208-525-7223	(Cate Carpenter, MS CCC-A)
	The Hearing Clinic	1662 John Adams Pkwy	83401	208-529-1514	(Gerald Mill, PhD., Kim Briggs, MS,)
Lewiston, ID	Valley Ear Nose & Throat	330 Warner Dr.	83501	208-746-0193	(Richard Yound, MS CCC-A; Maxine Miller, MS CCC-A)
Sandpoint, ID	Audiology Research Assoc.	420 North 2nd	83864	208-255-4389	(Clixie Larson, MS CCC-A; Yancie Kidd, MS CCC-A)
Missoula, MT	Western Montana Clinic	Box 7609	59807	406-721-5600	(Lynn Harris, AuD CCC-SP/A)
Ontario, OR	Ontario Audiology	1159 SW 4th Ave.	97914	541-881-0970	(Christine Wallace, MS CCC-A)
Logan, UT	Bridgerland Audiology	1350 N. 500 E.	84341	435-792-1855	
	Family Hearing Clinic	293 S. Main St.	84321	435-753-4133	(Robert Stevenson MS CCC-A)
Pullman, WA	Audiological Services	825 SE Bishop Blvd.	99163	509-332-8843	(Sharon Richardson MS CCC-A)

For further information contact: *Idaho Sound Beginnings* at: 208-334-0879, 800-433-1323 (Voice)
1720 Westgate Dr -A 208-334-0803, 800-433-1361 (TTY)
Boise, ID 83704 208-334-0952 (Fax)

or your regional Infant Toddler Child Development Center, Department of Health and Welfare (dial Idaho Careline at 211)
(For the most current information on pediatric audiologists check the website at www.state.id.us/cdhh/ehdi)

Risk Indicators for Late Onset or Progressive Hearing Loss

The Joint Committee on Infant Hearing suggests that the following indicators "…place an infant at risk for progressive or delayed-onset sensorineural and/or conductive hearing loss. Any infant with these risk indicators for progressive or delayed-onset hearing loss who has passed the birth screen should, nonetheless, receive audiologic monitoring every 6 months until age 3 years.

- Parental or caregiver **concern** regarding hearing, speech, language and or developmental delay.
- **Family History** of permanent childhood hearing loss.
- **Stigmata** or other findings associated with a **syndrome** known to include a sensorineural or conductive hearing loss or Eustachian tube dysfunction.
- **Postnatal infections** associated with sensorineural hearing loss including bacterial meningitis.
- **In-utero infections** such as cytomegalovirus, herpes, rubella, syphilis, and toxoplasmosis.
- Neonatal indicators specifically **hyperbilirubinemia** at a serum level requiring exchange transfusion, **persistent pulmonary hypertension** of the newborn associated with mechanical ventilation, and conditions requiring the use of extracorporal membrane oxygenation (ECMO).
- **Syndromes** associated with progressive hearing loss such as neurofibromatosis, osteopetrosis, and Usher's syndrome.
- **Neurodegenerative disorders**, such as Hunter syndrome, or sensory motor neuropathies, such as Friedreich's ataxia and Charcot-Marie-Tooth syndrome.
- **Head trauma.**
- Recurrent or persistent **otitis media** with effusion for at least 3 months.

Because some important indicators, such as family history of hearing loss, may not be determined during the course of UNHS programs, the presence of all late-onset risk indicators should be determined in the medical home during early well-baby visits. Those infants with significant late-onset risk factors should be carefully monitored for normal communication developmental milestones during routine medical care.

Source: Joint Committee on Infant Hearing Year 2000 Position Statement: Principles and guidelines for early hearing detection and intervention programs. American Journal of Audiology, 9,9-29. www.jcih.org/posstatemts.htm

Note: See also American Academy of Pediatrics - "Guidelines for Pediatric Medical Home Providers, www.medicalhomeinfo.org/screening/hearing.html

SELECTING EQUIPMENT

"The rapid expansion of Universal Newborn Hearing Screening (UNHS) programs has brought into focus questions about the most appropriate technique for newborn hearing screening. Due to the fact that there are so many different programs being conducted successfully with equipment in each category, there is probably not a definitive answer about which type of equipment is best.

Current physiologic measures used for detecting hearing loss of various severities include Otoacoustic Emissions (OAE's), either transient-evoked (TEOAE) or distortion-product (DPOAE), and/or Auditory Brainstem Response (ABR). Both OAE and ABR technologies have been successfully implemented for UNHS programs. Both technologies are non-invasive recordings of physiologic activities that underlie normal auditory function and are easily recorded in neonates. Both OAE and ABR measures are highly correlated with the degree of peripheral hearing sensitivity. (See table for information regarding differences between the technology).

Some infants with hearing loss will pass the newborn hearing screening. Both ABR and OAE technology can show false negative findings, depending upon whether hearing loss exists in configurations that include normal hearing for one or more frequencies in the target range. These would include isolated low frequency (i.e. below 1000 Hz) hearing loss, or steeply sloping high frequency (above 2000 Hz) hearing loss. ABR can show false negative findings with mid-frequency hearing loss (500-2000 Hz), and OAE can show false negative findings in some central auditory abnormalities (auditory dysynchrony). Additional variables that influence screening test performance include the population (age and presence of risk factors), the targeted hearing loss, the performance and recording characteristics of the test technology, the pass-refer criteria, and excessive retesting using the same technology (which increases the likelihood of a false-negative screening outcome).

The following REFERENCE TABLE (which can be found at: http://www.infanthearing.org/resources/equipment/equipmenttable.html) summarizes the research evidence and the clinical experience related to various types of newborn hearing screening equipment to help people select equipment to use in their own newborn hearing screening program. The purpose of this document is to outline some of the issues that should be considered in selecting equipment."

Selecting Screening Equipment Reference Table			
Issue	Automated ABR	DPOAE	TEOAE
1. Cost of Equipment Cost of equipment ranges from about $4,000 to $25,000 per unit. Because prices change frequently, specific figures are not listed here. Hand-held units tend to be the most inexpensive, while units which include both AABR and OAE technology tend to be the most expensive.	(See complete list of screening equipment at: http://www.infanthearing.org/resources/equipment/equipmenttable.html) Bio-logic Systems Corp – www.bio-logic.com Grason-Stadler Inc – www.viasyshealthcare.com Intelligent Hearing Systems – www.ihsys.com Madsen Electronics – www.madsen.com Maico – www.maico-diagnostics.com Natus Medical Inc. – www.natus.com Otodynamics Ltd. – www.otodynamics.com SLE – www.sle.co.uk SonaMed Corp. – www.sonamed.com Starkey Laboratories Inc. – www.starkey.com		
2. Cost of Supplies (Included here is the cost of all necessary supplies and reoccurring expenses (e.g., calibration) for doing screening. It does not include supplies for communicating the results of screening with parents or	$5.00-10.00 per baby includes the costs of disposable earphones and electrodes	$.50-1.50 per baby includes the costs of disposable tips for the probe assembly, calibration, and probe replacement	$1.00 per baby includes the costs of disposable tips and for the probe assembly and replacing the probe assembly every 750 babies

pediatricians, printing educational materials, or other ancillary materials. Costs are estimated per baby based on reported usage by typical programs with 1000-4000 births per year.)			
3. Initial Training of Screening Technicians (Although it is possible to start any program by reading the literature which comes with the equipment and teaching yourself, most programs find that hands-on, competency-based training by someone who is already experienced with that particular equipment and has used it successfully is the best way to begin a program. Estimated times are based on the experience of operational programs and includes only the initial training of screening technicians. Regular supervision with additional upgrading of skills should be included in addition to this initial training.)	2 hours	4 hours**	4 hours**
* Unless otherwise specified, most of the commentary for AABR only applies to the Algo 2 since it is the most frequently used automated ABR screener. ** Recently released hand-held units for OAE require only about one hour of training.			
4. Time to do Screening per Baby (This is often misunderstood because the term "screening time" is used by people to refer to different aspects of the screening process. As used here, it is the total amount of time devoted to screening babies and includes getting the baby ready for screening, talking to the parents if necessary, setting up the equipment, conducting the screening, recording information about the baby so results can be retrieved later, etc. "Screening time" is best computed by taking the total number of hours worked by screening technicians and dividing that time by the number of babies screened during that period. Numbers for each device are based reports of well-established programs.)	15-40 minutes per baby	10-30 minutes per baby	10-30 minutes per baby

5. What is Being Measured? (None of the devices is a direct measure of hearing. Instead, each one measures slightly different physiological mechanisms which are related to hearing. Issues related to this are discussed below.)			
5a. What Degree of Hearing Loss is Likely to be Detected?	As used in most programs, the Algo 2 uses a 35 dB nHL click and, consequently, would probably miss children with very mild sensory hearing losses (25 or 30 dB). An alternative mode for the Algo 2 measures at 40 dB and 70 dB.	Although there is not unanimous agreement among researchers, most believe that with the proper parameters, hearing loss as low as 25 dB nHL can be detected with DPOAEs.	There is substantial agreement that TEOAEs will be detected if hearing threshold is 25 dB nHL or better.
5b. Is Frequency Specific Information Available? (In addition to indicating whether or not a child has a hearing impairment, some people are interested in knowing at what frequencies that hearing impairment is likely to occur. Others argue that the purpose of a screening test is not to provide detailed information about the nature of the loss, but to identify those children who need further diagnostic tests, during which information about frequency and severity of hearing loss can be determined.)	The Algo 2 is a dedicated screening device. Screening is a selection procedure for diagnostics where hearing loss is confirmed and its characteristics defined. No frequency specific information is obtained by click evoked auditory potentials screening, but is available through completion of diagnostic ABR follow-up where it is used to make treatment decisions.	DPOAEs have the best potential for providing frequency specific information, and some argue that DPOAEs can be used as a diagnostic tool. However, this has not been sufficiently demonstrated. There is general agreement that DPOAEs provide more information about the higher frequencies (6-10 kHz) than do TEOAEs, but most would agree that the improved information in these higher frequency areas is not very critical for newborn hearing screening.	TEOAEs provide information about the frequencies at which emissions are detected between 1 and 5 kHz. However, the absence of an emission at a particular frequency does not always correspond to a hearing loss at that frequency.
5c. What is Being Measured?	The AABR provides information about the auditory pathway up to the brainstem (including the middle ear, the inner ear, and the VIII nerve).	DPOAEs provide information only up to and including the cochlea. Hence, infants with central auditory processing problems would not be discovered. Although definitive prevalence data are not available, most experts agree that this represents less than 1% of all children with hearing loss, or less than 3 children per 100,000 in the general population.	TEOAEs provide information only up to and including the cochlea. Hence, infants with central auditory processing problems would not be discovered. Although definitive prevalence data are not available, most experts agree that this represents less than 1% of all children with hearing loss, or less than 3 children per 100,000 in the general population.

6. Scoring Criteria and Ease of Interpretation (Because DPOAEs and TEOAEs produce a wave form for each infant, users must decide what constitutes a pass or a refer. Because the widespread use of these techniques is fairly recent, there is not universal agreement on what criteria should be used. In practice, however, this lack of agreement affects a very small number of infants, since in most cases emissions are clearly present or clearly absent, and it's only the relatively small number of infants around the cut point where disagreement occurs.)	The Algo 2 matches the ABR to a template derived from the waveforms of normally hearing neonates to 35 dB nHL click stimuli. The algorithm employs binomial sampling and a statistical test to determine that data collected sufficiently discriminates between the presence of a response + noise vs. pure noise at > 99% level of confidence. There is no operator interpretation needed. Studies which have compared the results of the Algo 2 with expert scoring of conventional ABR have found agreement ranging from 83% to 98%.	DPOAEs are the most recent of the techniques, and, not surprisingly, there is a lot of disagreement about what constitutes a pass or a refer. Most people have tended to use fairly conservative pass criteria until more data are available. The numerical criteria are easy to interpret, and most programs use technicians to make this determination in a few seconds per baby.	Although they have been used extensively since the early 1990's, there are still many different pass/refer criteria being used in TEOAE-based newborn hearing screening programs. The most frequently used criteria recommended by NCHAM is a very conservative criteria. Using this numerical criteria, interpretation is straight forward and is done in most programs by technicians in a few seconds per baby.
7. Flexibility of Administration	Because it was intended to be a completely automated system, the Algo 2 is designed to have very little flexibility. It is possible to screen at either 35 dB or at 40 dB and 70 dB, and it's possible to screen both ears simultaneously or each ear separately.	There is lots of flexibility in how the test is administered. Unfortunately, there is not unanimity about what parameters are best for screening (e.g., the different primaries to be used for f_1 and f_2, the intensity of the stimulus, or how many data points per octave are required for an adequate test).	Although there is a great deal of flexibility with regard to collecting TEOAE information, parameters used in screening programs are usually those recommended by NCHAM (e.g., QuickScreen, low frequency filter, peak stimulus between 78 and 83 dB SPL).
8. Flexibility of Use	The Algo 2 is a dedicated screener designed for use only with infants. Consequently, it can only be used for screening newborns.	In addition to being used for infant screening, DPOAE equipment is used with children and adults for monitoring the effects of surgery and drug administration and various diagnostic applications	In addition to being used for infant screening, TEOAE equipment is used to screen hearing with children and adults for monitoring the effects of drug administration and various diagnostic applications
9. Referral Rates (Screening is designed to identify a small group of at-risk infants who will require further diagnostic testing. As in all screening	Reported referral rates at the time the infant leaves the hospital for programs using the Algo 2 equipment range	Reported referral rates at the time the infant leaves the hospital for DPOAE programs range from 4% to 15%,	Reported referral rates for infants at the time they are discharged from the hospital range from 3% to 12%, with

programs, it is expected that some children who have normal hearing will be referred for further diagnostic testing, but the lower this number is, the better.	from 1% to 10%, with an average of about 4%.	with an average of about 8%. Since most DPOAE programs do a two-stage screening process where those who do not pass before discharge from the hospital are rescreened before referring them for diagnostic testing, the percentage referred for diagnostic testing is about 1%.	an average of about 7%. Since most TEOAE programs are a two-stage screening program, with infants who are referred at the time of discharge from the hospital being screened a second time before being referred for diagnostic assessment, the percentage of infants referred for diagnostic assessment ranges from 1/2% to 1%.
10. Screening in Noisy Situations (Noise which interferes with screening can come from the external environment or from the baby. Because newborn nurseries can be quite noisy, many people have questions about the effects of noise on newborn hearing screening procedures [this is especially true for intensive care nurseries.])	The Algo 2 manual recommends choosing a baby in a favorable state "sleeping, having been fed recently" for most efficient screening. An artifact reject system automatically interrupts data collection when ambient noise > 50 dB SPL at 2000 Hz and automatically resumes when conditions meet criteria again. Thus, the Algo 2 screens in noisy settings, but noise may slow data collection.	The key to screening in noisy situations is achieving good probe fit. Not all DP equipment provides feedback regarding adequacy of probe fit. Most DP units have artifact reject systems which exclude noisy data from averaging. Thus, the equipment can be used in noisy settings, but data collection is slower. Because DPOAEs measure one frequency at a time, they are more susceptible than TEOAEs to a response at that frequency being obscured by noise. Babies do not need to be asleep, but a noisy baby will slow data collection substantially.	The key to screening in noisy situations is achieving good probe fit. The ILO88 provides excellent real-time information to monitor probe fit and has an artifact reject system which excludes noisy data from averaging. Thus, the equipment can be used in noisy settings, but data collection is slower. Babies do not need to be asleep, but a noisy baby will slow data collection substantially.
11. How Many Children with Hearing Loss will Pass the Screen? (These children are often referred to as false negatives and reported as a measure of the test's sensitivity. It's important to minimize the number of infants in this category. While no screening test is perfect, ideally, as few children as possible should be in this group. This does not refer to children who have late onset	Infants with very mild losses (25 to 30 dB will likely pass the screening, as will infants with high frequency losses, reverse slope losses, or precipitous losses.	Children with neural or central auditory pathology or children having reverse slope losses may pass.	Children with neural or central auditory pathology or children having reverse slope losses may pass.

losses, but instead is only concerned with those children who have impaired hearing at the time of the test and still pass the screen.)			
12. Cost Per Infant Screened (Although there have been numerous reports in the literature and anecdotal reports about the cost per baby screened in newborn hearing screening programs, most of these analyses are based on gross estimates of time devoted to different tasks or have been incomplete [e.g., have ignored fringe benefit costs for personnel, indirect costs, supervisory costs, or costs associated with supplies and equipment]. How the program is organized can also have a big impact on the cost per baby. Because of such factors, people trying to interpret reported costs should be very cautious and remember that cost per baby is primarily a function of how long it takes to do the tasks, coupled with the hourly rate of people doing the work and the cost of supplies, equipment, and facilities.	Reported costs range from $15 to $75 per baby.	Costs per baby are not available for DPOAE programs, but they should be similar to those reported for TEOAE.	Reported costs range from $8 to $30 per baby.

National Center for Hearing Assessment & Management (NCHAM)
Utah State University - 2880 Old Main Hill - Logan, Utah 84322
Tel: 435.797.3584

Links to individual equipment manufacturers are located on the website:

http://www.infanthearing.org/resources/equipment/equipmenttable.html

Contact NCHAM for information concerning their equipment loan program.

RESOURCES:

Idaho Council for the Deaf and Hard of Hearing A state agency serving people who are deaf or hard of hearing.
1720 Westgate Dr. Suite A
Boise, ID 83704
(208) 334-0879 (voice)
(800) 433-1323 (voice)
(208) 334-0803 (TTY)
(800) 433-1361 (TTY)
www.state.id.us/cdhh
cooperp@idhw.state.id.us

Idaho Sound Beginnings (EHDI)
Early Hearing Detection & Intervention Program
Statewide newborn hearing screening program implementation, training, support and information.
1720 Westgate Dr. Suite A
Boise, ID 83704
(208) 334-0829
(800) 433-1323
www.infanthearing.org
www.state.id.us/cdhh/ehdi

Idaho School for the Deaf and Blind
Early Intervention Services for Deaf and Hard of Hearing Children, including regional Outreach services, and a hearing aid loaner bank.
1450 Main St.
Gooding, ID 83330
(208) 934-4457 V/TTY
FAX (208) 934-8352
www.isdb.state.id.us

Idaho Care Line
Provides referrals for health and human services around the state. Provides information on regional Infant Toddler services and offices.
DIAL # 211
(Se habla espanol)
or 1-800-926-2588
(208) 332-7205 TDD
www.idahochild.org

Idaho Infant Toddler Program
Bureau of Developmental Disabilities
Department of Health and Welfare
PO Box 83720
450 W. State Street
Boise, ID 83720-0036
(208) 334-5514
www.idahochild.org

Infant Toddler Regional Child Development Centers
Early Intervention Specialists and Speech Pathology Services
Newborn hearing screening/rescreening
Early intervention services for children with developmental delays.
Tracking and monitoring of infants at-risk.

Region 1
2195 Ironwood Ct. Coeur d'Alene 83814
208-769-1409

Region 2
1350 Troy Highway Suite 2, Moscow 83843
208-799-3460

Region 3
823 Parkcenter Way, Nampa 83651
208-465-8460 ext.316

Region 4
1720 Westgate Dr. Suite B, Boise 83704
208-334-0914

Region 5
803 Harrison St., Twin Falls 83301
208-736-2182

Region 6
421 Memorial Dr., Pocatello 83201
208-234-7900

Region 7
2475 Leslie Ave. Idaho Falls 83403
208-525-7223

RESOURCES:

Assistance League of Boise
Operation: Can You Hear Me?
Activities include: hearing testing of schoolchildren, a hearing aid bank financial assistance to purchase assistive devices, and other hearing related services.
5825 Glenwood,
Garden City, ID, 83714
(208) 377-4327
www.alboise.org

Pediatric Audiologists – Appendix C

NCHAM-National Center for Hearing Assessment and Management
Provides training and support for Hi-Track software program.
University of Utah
888-827-0800
NCHAM.helpdesk@usu.edu

State of Idaho Genetic Services Program
Department of Health and Welfare
Boise, ID
(208) 334-2235 ext. 261

Websites:

American Academy of Audiology	www.audiology.org
American Academy of Pediatrics	www.aap.org
AAP Medical Home (online CME info.)	www.medicalhomeinfo.org/screening/hearing.html
American Academy of Otolaryngology	www.entnet.org
American Society for Deaf Children	www.deafchildren.org
Boys Town Infant Hearing	www.babyhearing.org
CDC EHDI Program, (research etc.)	www.cdc.gov/ncbddd/ehdi/
"Just in Time" EHDI presentations and posters for physicians and families	
Council for the Deaf and Hard of Hearing	www.state.id.us/cdhh
Families for Hands & Voices	www.handsandvoices.org
Idaho Infant Toddler Program	www.idahochild.org
Idaho Sound Beginnings	www.state.id.us/cdhh/ehdi
Idaho Speech, Language & Hearing Association- ISHA	www.idahosha.org
March of Dimes (Fact Sheet-English and Spanish)	www.marchofdimes.com/home.asp
National Association of the Deaf (NAD)	www.nad.org
National Institute on Deafness and Communication Disorders	http://www.nidcd.nih.gov
National Center for Hearing Assessment and Management	www.infanthearing.org

Policy Statements:

AAP Position Statement: http://aappolicy.aappublications.org/cgi/content/full/pediatrics;103/2/527

Joint Committee on Infant Hearing Position Statement 2000:
http://aappolicy.aappublications.org/cgi/content/full/pediatrics%3b106/4/798

RESOURCE:	NOTES:

RESOURCE:	NOTES:

Fax To: Idaho Sound Beginnings

Early Hearing Detection and Intervention (EHDI)

Council for the Deaf & Hard of Hearing ~ 1720 Westgate Dr. ~ Boise, ID
PHONE: (208) 334-0983

FAX: (208) 334-0952

FROM: **Hospital/Office:**

PHONE #: **DATE:**

SUBJECT: **Order for: "Newborn Hearing Screening Referral Forms and other Materials"**

PAGES: **(including cover)**

Instructions: You may use this fax form to order additional quantities of referral forms and parent education brochures, etc. for your hospital's use.

If you prefer, you may also order by phone ☎, E-mail, or mail ✉.

- **Referral Forms-** **English:**_____ (quantity) **Spanish:**_____ (quantity)
- **Parent Education Brochures:** **English**:_____ (quantity) **Spanish:**_____ (quantity)
  "What do I do now"
- **Guidelines for EHDI:** _____ (quantity)
- **Other Materials:** _____
  _____(quantity)

Comments

****

Please send- ATTN:_____ **Dept.:**_____

Hospital Address: _____**City:**_____**Zip**_____

Comments or Questions:_____

Other items that are available hard copy or electronically (may be copied) for your use:

"Newborn Hearing Screening"- educational pamphlet for parents, may be used during childbirth educ. classes

"I had my first hearing test" – sample form for parents showing results of test and risk indicators, if present.

"Help and Hope" parent resource manual. Videos and presentations are also available for educational use.

Check our website – **www.state.id.us/cdhh** (EHDI) for online availability of materials and other information.

IF YOU HAD TROUBLE IN RECEIVING THIS FAX OR RECEIVED THIS FAX IN ERROR, PLEASE NOTIFY SENDER IMMEDIATELY BY TELEPHONE. **IF YOU DO NOT RECEIVE YOUR ORDER WITHIN 10 DAYS**, PLEASE CALL.

Or call us at: 208-334-0983; FAX–208-334-0952

Skills Checklist for AABR Screeners

PREPARATION FOR TEST:

Documentation:
___Enters baby's demographic information – Name, DOB, address, phone, primary care physician's name and contact information
___Selects screening application (35 dB or 40 dB)
___Selects screening method (R/L, sequential or simultaneous)

Equipment:
___Collects supplies
___Connects sensor clips to sensors
___Identifies and prepares sites for 3 sensors
___Places sensor/clips on baby in correct locations
___Checks impedance and adjust sensors as needed

Patient:
___Follows hospital sanitation protocol
___Swaddles infant and/or quiets baby
___Selects or ensures a quiet environment

SCREENING:

___Checks and confirms ear to be tested
___Places blue transducer left, red transducer right
___Starts test when baby is quiet
___Runs screening procedure
___Observes and troubleshoots as necessary
___Views results, prints label
___Removes cable connections from baby

COMPLETION:

___Prints results & places stickers in chart/notebook
___Documents in hearing log book that test is completed
___Communicates activities to parents according to protocol
___Enters charges for screening costs
___If referred, or if risk indicators are present, completes **ISB Referral Form** (obtain parent's signature), and makes appointment for follow-up according to protocol.

MAINTENANCE:

___Demonstrates how to clean sensor cables
___Demonstrates how to clean earphone cable

_____ _____/_____

Screener's Name **Evaluator / Date**

Skills Checklist for OAE Screeners – AUD X (Biologic)

PREPARATION FOR TEST:

Documentation:
___Enters baby's demographic information into Notebook– Name, DOB, address, phone, primary care physician's name & contact information
___Transfers data to Hi-Track
___Enters patient demographic information on Screen 1

Equipment:
___Unplugs AuDX unit from charger
___Selects appropriate ear tip & places flush on probe

Patient:
___Follows hospital sanitation protocol
___Swaddles infant and/or quiets baby
___Selects or ensures a quiet environment

SCREENING:

___Checks and confirms ear to be tested
___Inserts probe correctly - pulls ear up and out, probe remains without support
___Obtains good probe fit
___Positions cord and equipment correctly
___Selects new test
___Starts test when baby is quiet
___Understands calibration errors (probe occluded, etc.)
___Obtains acceptable results: Noise level ≤ 50%
___Obtains acceptable results: Stability level ≥ 80% (S)

COMPLETION:

___Prints results & places stickers in chart/notebook
___Documents in hearing log book that test is completed
___Records screening results in Hi-Track & patient's flow sheet
___Communicates activities to parents according to protocol
___Screening equipment stored properly and connected to charger
___Charges for screening costs entered
___If referred, or if risk indicators are present, – completes **ISB Referral Form** (obtain parent's signature) and makes appointment for re-screen In 7-14 days.

MAINTENANCE:

___Demonstrates how to clean the probe-tip

_____ _____/_____

Screener's Name **Evaluator / Date**

Skills Checklist for OAE Screeners - Echo-Screen

PREPARATION FOR TEST:

Documentation:
___Turns on data computer
___Accesses Info Link
___Enters baby's demographic information

Equipment:
___Turns on power switch for Echoscreen unit
___Selects appropriate ear tip and places flush on probe

Patient:
___Follows hospital sanitation protocol
___Swaddles infant and/or quiets baby
___Selects or ensures a quiet environment

SCREENING:

___Checks and confirms ear to be tested
___Inserts probe correctly -
pulls ear up and out, probe remains without support
___Obtains good probe fit
___Positions cord and equipment correctly
___Selects test number
___Starts test when baby is quiet
___Understands calibration errors (IS, PE, CF)
___Obtains acceptable results: Noise level ≤ 50% (A – artifact)
___Obtains acceptable results: Stability level ≥ 80% (S)

COMPLETION:

___Prints results & places in chart/notebook
___Documents in hearing log book that test is completed
___Records screening results in Info Link & patient's flow sheet
___Communicates activities to parents according to protocol
___Turns off screening equipment and stores properly
___Charges for screening costs entered
___If referred, or if risk indicators are present, – completes **ISB Referral Form** (obtain parent's signature) and makes appointment for re-screen 7-14 days.

MAINTENANCE:

___Demonstrates how to change battery
___Demonstrates how to clean the probe tip

_____ _____/_____

Screener's Name **Evaluator / Date**

Skills Checklist for OAE Screeners - ILO88 (Otodynamics)

PREPARATION FOR TEST:

Equipment: ___Turns on computer (CPU & monitor)
___Turns on ILO88 analyzer
___Connects probe to analyzer

Patient: ___Follows Hosp. sanitation protocol
___Swaddles infant correctly

Software: ___Accesses HIScreen
___Enters baby's demographic information
___Selects infant name for screening

SCREENING:

Left	Right	Software:
____	____	Confirms infant to be screened
____	____	Confirms ear to be screened

Left	Right	Subject:
____	____	Positions infant correctly
____	____	Manipulates pinna & tragus, examines ear canal size & angle
____	____	Obtains good probe fit
____	____	Positions cord correctly

Left	Right	Checkfit:	Left	Right
____	____	Stimulus waveform present. If not - check that ILO88 analyzer is on	____	____
		- check probe tip for debris	____	____
____	____	Proper stimulus spectrum shape. If not - manipulates ear	____	____
		- refits probe, check for debris	____	____
		- repositions cord	____	____
____	____	Stimulus intensity 78-83 dB. If not - presses "A" twice	____	____
____	____	Noise level at or below green/yellow bar. If not - calms baby	____	____
		- refits probe, check tip for debris	____	____
		- reduces environmental noise	____	____
____	____	Begins Screening		

Left	Right	Screening Data Collection:	Left	Right
____	____	At 40 quiet samples, response present		
		If not, & noise reject level > 48 dB & noise floor does not taper off, escapes & returns to Step 2-Subject	____	____
		If not, & noise reject level ≤ 48 dB & noise floor tapers off, escapes& returns to 'Step 2 –Subject,' trying a larger probe tip	____	____
____	____	Band reproducibility levels meet or exceed program "pass" criteria		
____	____	Number of quiet samples meet or exceed program "pass" criteria		
____	____	Terminates screening		
____	____	Saves data file		

WRAP UP:

____ Removes infant's name from screening list
____ Records screening activity according to program protocol
____ Communicates screening activities to parents according to program protocol
____ Exits HiScreen and turns off screening equipment

Screener's Name: _____ Evaluator / Date: _____- ___/___/___

HI*Track 3.x for Windows
Training Outline *

1 INSTALLATION:

☐ **A. SYSTEM REQUIREMENTS**

- IBM-compatible PC or laptop with a 300 MHz processor
- *Windows (95**)** , 98, NT 4.0 (Service Pack 6), 2000 (Service Pack 2) or XP
- Internet Explorer 4.01 SP2 or later (HI*TRACK 3.0) and Internet Explorer 5.5 or
- 6.0 (HI*TRACK 3.5)
- 200 MB available hard drive space
- Monitor with a minimum resolution of 800 x 600 pixels

* *Hi * Track 3.0 only*

2 HI*TRACK includes both a Screening Module (Info Screen) and a Tracking Module (Hi*Track)

☐ **A. Info Screen** is helpful for those using hand-held devices or other screening equipment that has limited or no data collection capabilities

☐ **B. HI*Track** is a powerful tracking and follow up software, that will help you to collect screening and demographic information, identify children with hearing loss and refer them for early intervention services. It is easy to create and generate letters for Parents (or preferred contacts) and physicians. The helpful "built in" reports make it easy to monitor overall program performance and track infants who do not pass the screening to ensure that they receive the proper follow up care. Hi*Track will allow you to collect and report statistics to "Sound Beginnings" at the State of Idaho.

3 CONFIGURE HI*TRACK USING THE Configuration Wizard.

☐ **A. In the Configuration Wizard** you will configure Hi*Track to meet your program needs. If you need to change the configuration at a later date, you can do so by clicking on Preferences and then clicking the Configuration Wizard button to make your changes.

4 

Setting Preferences: HI*TRACK lets you set your own hospital values for:

☐ **A. Physicians**
☐ **B. Audiologists/Screeners**
☐ **C. Hospitals/Screening sites**
☐ **D. Nursery Levels serving infants in your program**
☐ **E. Insurance associated with your screening program**
☐ **F. Early Intervention services**
☐ **G. Patient record formats for data entry**
☐ **H. Letter Options for letters sent to parents and physicians**
☐ **I. Required Fields**
☐ **J. Screening Equipment type**
☐ **K. Merge Settings**
☐ **L. Advanced Tab: you set the location for your infant record database and select whether you want to log changes**
☐ **M. User-Access Security features**
☐ **N. Linking HI*Track with Your Screening Software**

5 Info Screen Overview:

☐ **A. Use Info Screen** if you have a handheld screening device, to enter the basic demographic data on infants who need to be screened. Then add screening results, and export the completed records into HI*Track. Infant records should generally remain in the screening module until screening is completed or the infant is discharged.

☐ **B. Screening Tasks and "Quick Add"**

Create a new child record for every infant born or transferred into your program. The colored fields indicate mandatory data.

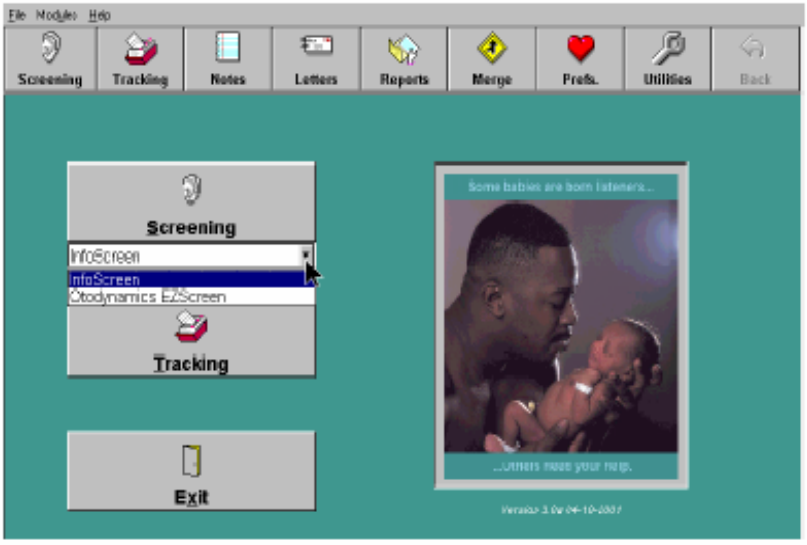
1 On the Hi*Track main screen, click screening.
2 Click the New button at the bottom left of the screen.
3 Enter the child's information in the appropriate fields.
4 Print a list of all infants by clicking the "Print lists" button.
5 To enter screening results, click on the screening button and the InfoScreen browse list appears.
6 Click once to select an infant's name.
7 Click the **Quick Add** button to add the information.
8 Click the Yes button to add the results.
9 Click the **FINISH** button to export the updated record to InfoTrack.

Shortcuts
To Move Forward: Click on a field or press the Tab key. **To Move Backward:** press Shift-Tab
If you do not have the correct Medical ID #, you can temporarily use the HI*Track Auto ID# by pressing the **F2** key.

6 HI*Track Overview:

☐ The tracking browse screen is where HI*TRACK displays all infant records and the basic data is summarized under column head-ings. User-friendly filters at the top of the screen allow you to browse the database in a variety of ways. Buttons at the bottom of the screen allow you to add, find, or work with individual infant records.

HI*TRACK Main Menu Screen



7 Description of Hi*Track buttons:

- **Screening buttons:**
  Access the screening software module where infant data and screening results are recorded. Data is then exported to the HI*Track module.
- **Tracking buttons:**
  Open the HI*Track browse screen where infant records are stored.
- **Notes button:**
  Opens a browse list of all infants who have Notes in their records.
- **Letters button:**
  Lets you edit and print letters to mothers, alternate caregivers, physicians, and/or Early Intervention (EI) service programs.
- **Reports button:**
  Helps you conduct follow-up and monitor screener and overall program performance.
- **Merge button:**
  Imports infant demographic and screening data from screening software.
- **Preferences button**:
  Lets you customize the software by adding or editing Program Information.
- **Utilities button:**
  Lets you import or export Program Information, back up data, set security.
- **Back button:**
  Returns you to a previously opened screen.

8 Description of Browse Screen Filters:

- **Display**: switches column headings and content to show either the infants' Medical ID# or HI*TRACK# (assigned by the software as infants enter the database), Birth Facility or Screening Site.
- **DOB Range:** displays all records within a specified time period. The default for the ending date range is always the current date.
- **Result Filter:** limits the infant records displayed by certain screening result criteria or by confirmed losses. All, Loss Confirmed, Not Passing Inpatient, Not Passing Outpatient.
- **Hospital Filter** allows a user to view infants born or screened at one specific hospital.

9 Description of the Function Buttons at the bottom of the browse screen:

- **New—**add a new infant record manually.
- **Edit—**edit a selected record.
- **Delete—**delete an unwanted record.
- **Sort—**sort the database in various ways.
- **Find—**find a specific infant's record.
- **Print—**print a list of records on the browse screen

Shortcuts:

1. **Double-Click** on an infant's record to open and edit it.
2. **Single Click** on a column heading to sort the database by ascending or descending order.

Click the same heading again to reverse the sort order.
(Applicable to Child's Name, Medical ID#/HI*Track# and Birth Date columns)

10 HI*Track features can be used in the following way:

Step 1: Merging screening data into HI*Track

☐ a. If you are using both Info Screen and HI*Track on the same computer, the infant's record is automatically transferred from Info Screen into HI*Track when the record is highlighted and the **FINISH** button is clicked.

☐ b. For all other software configurations, data is downloaded from the screening equipment to diskette (or to a designated location on the hard drive) where it is then picked up by Hi*Track during the merge process. (See Hi*Track User Guide, page 122-Appendix B for complete instructions for linking with screening programs/equipment other than Info Screen.)

Step 2: Updating infant records

☐ a. On the Tracking browse screen, use the Results Filter drop-down menu to select "Not Passing Outpatient", then click on the Birth date column heading to sort records chronologically.

☐ b. For infants who referred from outpatient screening, the person handling the tracking should open each record and enter a Diagnostic Recommendation and a Due Date by which it should be completed. Update other records as needed.

☐ **Step 3: Generating letters:** Generate letters that communicate screening results to parents (or preferred contacts) and physicians. Refer to the Hi*Track manual for more information on generating letters.

☐ **Step 4: Generating reports:** As needed, you can generate a "Needs Outpatient Screening" and a "Needs Diagnostics" report to review the status of infants who need follow-up. Additional reports, such as the "Flow Chart" provides you with a concise, one page summary of your hearing screening program.

11 Transferring Data to a Central (State) Database:

☐ Set up the State Transfer feature before making your **first** transfer. This setup process requires a **Public Key** file and a **Centrally-assigned Unique Transfer ID** for your hospital. This file is provided by "Sound Beginnings" on either a floppy disk or by email in which case you would copy the Public Key file to a floppy disk or a file on your hard drive.

☐ **A. Setting-up the data transfer:**

1 To set up the Transfer feature: On the HI*TRACK main screen, click on the utilities Tab. Select the **State/Regional** Transfer tab.

2 Click the **Install** button. An Install Key from: dialog box appears

3 Enter the install path for your Public Key file (if it is on a diskette, insert the diskette in your disk drive) and then click the **OK** button

4 Verify that your hospital or screening facility name is displayed, or select the correct one from the drop-down menu.

*Note: If the correct hospital <u>is not listed</u> go to Preferences > general tab > hospital / screening sites > add > input hospital information > apply. After the public key is installed you will need to repeat the above information to locate field to enter the Unique Transfer ID code assigned to your hospital by the state coordinator. Each Hospital in HI*TRACK must have a unique Transfer ID to transfer data.*

5 Click the **Close** button.

→ **B. Transferring data files: *monthly !***

1 After you complete the initial transfer data set-up, transfer files using the following procedure:

a. On the HI*TRACK main screen, click on the **Utilities** button. The Utilities tab appears
b. Select the **State/Regional Transfer** tab.
c. Verify your Hospital, the Export path, and whether you are transferring data with Personal Identifiers.
d. Click the **Standard Data Transfer** button.

*** The number of records on the button shows how many records are transferred. (Only records which have been added or updated since the previous transfer are sent in a subsequent transfer.) The Transfer Log opens automatically indicating how many records were copied to the transfer file.
***Note: All transfer files are fully encrypted to protect patient confidentiality.

12 Maintaining the Tracking Database:

A. Backing up data is one of the most important elements of good data management. Although the HI*TRACK Back-up feature is not a sub-stitute for a permanent back-up system, this utility does provide a quick and convenient way for you to copy infant records and critical program information to a diskette or zip drive. If you do not have another back-up system, take advantage of this feature to back up your data on at least a weekly basis.

B. To back up your HI*TRACK data:

1 On the HI*TRACK main screen, click on Utilities tabs.
2 Select the **Backup/Restore** tab.
3 Verify the path or "destination" where you want your back-up file placed
4 If needed, place a diskette in the drive.
5 Click the **Back-up Data** button.

Your Program Information and infant records will be compressed (zipped) and copied to the designated location. The back up function is only available when the database is available locally.

C. Restoring your HI*TRACK data:

To Restore your HI*TRACK data: On the HI*TRACK main screen:

1 Click the Utilities tab and select the **Backup/Restore** tab.
2 Verify the location of your backup file.
3 Click on the **Restore** Data button. Your data is unzipped and copied into your HI*TRACK database.
Note: Use this utility with caution as it overwrites your existing database.

*** CONSULT THE "HI*TRACK FOR WINDOWS USER GUIDE" FOR COMPLETE INFORMATION**

An updated version of the 'User Guide' is available on the Hi*Track website at:
http://www.hitrack.org/support/index.html

NOTES

Hi*Track safeguards that make it compliant with HIPAA:
Password protection, user-specific access to program functions.
State-of-the-art encryption technology to secure transfers of data to reporting sites (e.g. hospitals to state)
Logs all data transfers for auditing purposes.
Secure backup of data transfer files for accounting to patients of disclosures of their protected health information.
Data can be sent to NCHAM for technical support, as needed, given Business Associate Agreements.
Are hospitals, as covered entities under HIPAA, in compliance when they send NHS data to a State health agency?

Yes, ISB conducts public health surveillance for EHDI n its capacity as a public health authority as defined by HIPAA. The state agency, therefore, has the authority to obtain protected health information from covered entities for the purpose of the NHS program. [45 CFR § 163.506]

2004

GUIDELINES FOR EARLY HEARING DETECTION AND INTERVENTION

Hospital: _____

Newborn Hearing Screening Coordinator: _____

Contact Information: _____

Screening Equipment: _____

Model/Manufacturer: _____

Other Information: _____

Program Notes, Protocol, Contact and Other Information:

Early Hearing Detection and Intervention in Idaho

All birth hospitals in Idaho are participating in Newborn Hearing Screening.

Screening (for 'home births' and others) and/or rescreening can also be done at any regional Infant Toddler-Child Development Center.

Dial the Idaho CareLine at 211 for locations.

(Please refer parents to the CareLine if they need assistance with obtaining a screening, the Infant Toddler Program will be able to help.)

1720 Westgate Dr. Boise, ID 83704

2004